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ORIGINAL ARTICLES.

ON THE TREATMENT OF THE SO-CALLED PERITYPHLITIC ABSCESS.[1]

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THE subject of the origin and treatment of perityphlitic abscess has been largely dwelt upon within the last few years in the various medical societies in our principal cities, and notably quite recently by the leading physicians and surgeons in the important medical centres of Boston and Philadelphia. Though nothing specially novel can be presented in the following remarks, yet reiteration of the principal views in connection with this subject will be of importance, and especially so, it is thought, to the general practitioner. The latter will find, as his experience grows, that there are apparently two classes of perityphlitic abscesses, one of which progresses with comparatively few alarming symptoms, and develops into an abscess which either opens spontaneously, or which he, if he has recognized from the usual symptoms the presence of pus, opens with the knife, whereupon the patient, as a rule, promptly gets well. Again, a second form presents itself with more or less sharply marked symptoms of peritonitis, with the formation subsequently of a tumor in the region of the cæcum, which in due time, like the preceding one, resolves itself into an abscess. He may also meet cases in which a fulminating peritonitis destroys life in a few days. The consideration of this latter condition of affairs can, however, be laid aside for the present.

The practitioner will find it difficult to reconcile to himself that all three of these varieties have a common origin. If he consults his text-books he will learn that there are two distinct varieties therein spoken of. Some of these authorities he refers to will say that the inflammatory action is from the beginning in the connective tissue outside the peritoneal cavity behind the cæcum; and others that the inflammation has begun in the peritoneal cavity from a lesion of the cæcum or appendix and has gained the connective tissue outside the peritoneum through a perforation of the adhesions gluing the visceral and parietal peritoneum together; and finally, the latest works on this subject will tell him plainly and positively that the inflammation and abscess are from the beginning in the peritoneal cavity, and that the pus only approaches toward the surface by a natural destructive process common to abscesses generally. Among the most noted names that can be adduced in favor of these abscesses originating in the connective tissue posterior to the cæcum, are those of Bamburger, who, in 1853, stated that this view was a correct one, though he admitted that the peritoneum might be secondarily involved and so give rise to a circumscribed or general peritonitis. Oppolzer likewise, in 1863, remarked that perityphlitis meant an extra-peritoneal inflammation of the connective tissue behind the cæcum; he, however, also said that it was difficult to differentiate the diagnosis between the abscess thus resulting and that coming from ulceration and perforation of the appendix vermiformis.

It is hardly worth while to go further into a citation of the various writers who have supported these different views concerning the cause of a perityphlitic abscess. The recent articles of Fitz and others interested in the subject have amply demonstrated the incorrectness of the views of the observers first named. It is now clear to every one who has given attention to this subject that all these abscesses originate in an inflammation, simple or gangrenous, or in a perforation, and more commonly it is the latter, of the appendix vermiformis.

That the abscess might be due to a perforation of the cæcum is conceded, though such perforations are found at post-mortem examinations to be commonly caused by an abscess opening into the bowel or to necrotic ulceration from an over-distended colon from a stricture further down the intestinal tube. Cæcal perforations of any kind are, however, very rarely met with.

While this prominent fact of the inflammation or perforation of the appendix as a cause of perityphlitic abscess has now been admitted by most surgeons, yet not a few still cling to the belief that the perforation takes place in such a way that an opening, small in size, is made directly from the appendix through the parietal peritoneum into the sub-peritoneal connective tissue behind the cæcum. Two serious objections have been raised to this belief. The first objection comes from the recent observations of Mr. Treves in respect to the peritoneal covering of the appendix and cæcum itself. It is now

[1] Read at the meeting of the Medical Society of the State of New York, February 6, 1889.

the common property of the profession, through this surgeon's dissections, that these two parts of the intestinal tract are entirely covered by peritoneum. This is not a new discovery of Mr. Treves. He has only proclaimed it loudly and at a most opportune time.

Bardeleben, in 1849,[1] from an examination of one hundred and sixty cadavers, asserted as a certainty that the cæcum is completely surrounded by peritoneum, and lies so freely movable in the peritoneal cavity that it can be pushed upward and laterally. He, moreover, said at this early period that it follows, if this is corroborated, that the definition of a perityphlitis as an inflammation of the connective tissue of the posterior surface of the cæcum cannot be justified.

Luschka,[2] the distinguished anatomist, in 1861, declared that in the fœtus the peritoneum surrounds entirely the cæcum and appendix, and that this is a usual thing, and is, as a regular rule, to be found in post-fœtal life. Moreover, Luschka states that one cannot open the cæcum and appendix without opening the general peritoneal cavity; and he, too, remarks that perityphlitis, as it was then commonly regarded, was an impossible condition, unless there had been previous adhesions.

Corroboration of these views has been made by Dr. Richardson, of Boston,[3] and I have myself in thirty autopsies had the position of the cæcum and appendix carefully observed by Dr. Ferguson, pathologist to the New York Hospital. His report is to the effect that the cæcum and appendix were covered entirely by peritoneum in twenty-eight instances, the cæcum only partially covered in one instance, and it was not stated in another. It may be mentioned as a matter of some interest in this connection that in sixteen of the cases the appendix rested beneath and posterior to the cæcum. Treves has found this to occur in eighteen per cent. of the cases observed by him.

While ranging myself with those who strongly believe in the origin of these abscesses in an inflammation or perforation of the appendix vermiformis, yet I must confess from the clinical standpoint it is rather a difficult matter to prove this. Out of an experience of twenty-six abscesses of this sort that have been opened by me, in only some eight of them have I been able to recognize that the inner wall of the abscess was made up of loops of intestine bound together by adhesions. This experience has come to me, however, only within the last three or four years. I believe had I fairly tested this question in my earlier cases this number would have been increased, but it must be clear to every one that it is a test that cannot be applied with much thoroughness on account of the possible risks connected therewith. In fact, I do not advise that the matter should be determined in this way. I have elsewhere demurred to such explorations, or even to washing out the cavity of the abscess after it has been opened with liquids, plain or medicated, lest the limiting adhesions of the peritoneal boundaries of the abscess should be damaged, and the patient's safety jeopardized. I believe, moreover, and this my experience confirms, that in many cases it is utterly impossible after the abscess is opened, and it is explored gently and judiciously by the finger, that the surgeon can determine whether the abscess is external to or within the peritoneal cavity. I do not think that evidence of a negative character thus obtained is worth anything at all in settling this question.

I have, therefore, been led to see if a solution could be arrived at by considering a large number of autopsies of this affection. I have taken pains to gather indiscriminately from the *Index Medicus* 100 cases of perityphlitic abscess, where an autopsy has been obtained, and on analyzing these reports have obtained the following result. Out of a total of 100 autopsies, I found that the appendix was perforated 84 times; that it was inflamed and not perforated 3 times; that the cæcum was perforated 4 times, 2 of which were due to ulcerations proceeding from without inward—in other words, from abscesses opening into the cæcum; in 9 cases the condition of the cæcum and appendix was not stated.

As to the site of the abscess, which was an important fact to be ascertained in these 100 autopsies, 22 of them showed intra-peritoneal circumscribed abscesses; 13 intra-peritoneal abscesses and general peritonitis; 57 general peritonitis without abscess; and in but 4 instances was there an extra-peritoneal abscess; in 10 the condition was not stated.

Now this is a very strong point in favor of the propositions with which I have started: first, that these abscesses are invariably due to inflammation or perforation of the appendix vermiformis; and, second, that, as a rule, the abscess itself is developed within the peritoneal cavity. Not only out of the 100 cases were there only 4 extra-parietal abscesses, showing the rarity of this form of abscess, but also it is to be remarked, that in all these 4 there was a *large* communication between the intra- and extra-peritoneal portions of the abscess. Putting it in a different shape, it can be said that in no instance out of the 100 autopsies did there exist the gluing together of the appendix with the parietal peritoneum, and a primary escape of the contents (fecal or otherwise) of the appendix into the connective tissue by boring through this adhesion, and by the

[1] Ueber der Lage des Blinddarms beim Menschen. Arch. f. Patholog., Anatomie u. Physiologie, Bd. ii. S. 583, 1849.

[2] Ueber der peritoneale Umhülling des Blinddarms. Arch. f. Path. Anat. u. Physiol., Bd. xxi. S. 285, 1861.

[3] Boston Med. and Surg. Journal, February, 1888.

subsequent development of pus in the extra-peritoneal tissues.

There was another fact developed in connection with the examination of this collection of autopsies which must be of great importance to the physician, for he it is who sees the cases in their inception. It is this: that in only one case was the cæcum more than ordinarily filled with feces. Now, if there is anything else that is more firmly fixed than another in the practitioner's mind it is this: that the majority of troubles in this region are due to an accumulation of feces in the cæcum, and it is a rule almost prevalent in the medical profession that a purgative should initiate the treatment of these cases. It must be conceded that if it be correct, or if it be presumably correct, that the inflammatory conditions are most likely to originate from a perforation of the appendix, then this fact of itself should preclude the administration of a purgative, of even an enema; and much more would this direction become an absolute one when it is now taken into consideration how rarely stercoral accumulations are met with in this affection. Even catarrhal conditions as factors in the disease are scouted at by Treves.

The facts presented by With are likewise very convincing in this direction. This observer presented, in 1880, a series of 30 cases treated in their beginning by himself, or by his colleagues, after the ordinary method, with the result of 40 per cent. of deaths. In 1884 he again[1] reported a series of 50 additional cases similarly met with, of which only 16 per cent. died. His treatment, however, was entirely different. Purgatives, rectal injections, etc., were sedulously avoided, opium was administered as soon as the disease was encountered, and the patient immobilized as far as practicable, urination and defecation being accomplished with the greatest care and freedom from motion. I can confirm myself, in two instances, the good results of this strenuous treatment instituted in the very beginning of the disease, that is to say, when it may be inferred that the perforation is about to occur or has just taken place.

With these facts in hand, the way is before us to appreciate the proper treatment for these apparently varying affections. Indeed, the aim of this paper, and the aim, I take it, of all the papers entertaining this view that have been published in recent years, is to force upon the mind of the profession, both medical and surgical, the important fact of the *origin* of this disease, because, as With himself states, with this kept constantly in view a proper treatment is more likely to be followed; either the medical one of immobilization, or, if this should prove of no avail, that the surgeon should stand, knife in hand, ready to use his instrument as occasion may demand.

[1] La Péritonite appendiculaire. Copenhagen, 1884.

I do not intend by this picture to give rise to the idea that in every case surgical interference should be immediately resorted to. I have learned by experience that many cases of moderate severity do not go beyond the stage of plastic exudation and subside without abscess; also, that some few abscesses disappear by a presumed opening into the bowel—not always to be proved. I know that delay may be safely resorted to, from the progress of some of the twenty-six cases of operations which have occurred under my own charge, wherein a comparatively late incision was made. This occurred in nearly all of them, not, however, from my own choice, but because they were either hospital cases that came late under my observation, or they were seen in consultation in private practice after the disease had already existed some time. In this number of cases only one death has occurred, and that from an abscess of tubercular origin and in a phthisical patient in the last stages of his disease. Yet though all these, save that one, recovered, a good many of them had a very narrow escape from death by reason of the extensive suppuration, or the threatened sepsis that followed the retention of pus in a large, irregular cavity, or, in some cases, by the prolonged fecal discharge.

I do not know that the lateness of operation influenced this latter point much. Still, the statistics afforded by Noyes, quoted elsewhere,[1] bear out the conclusion that the earlier the safely progressing or subacute abscesses are opened, the better are the chances of the patient. Out of 100 cases Noyes found that in 88 operated upon after the eighth day 17 per cent. died, and of 12 operated upon before the eighth day, 8½ per cent. only died. There is also a risk that the patients carrying these slowly progressing abscesses are exposed to, and it is that the abscess itself may burst into the peritoneal cavity. In 67 cases collected by Dr. Bull, 8 burst into the general peritoneal cavity, and in 12 collected by With, 6 terminated in the same way. It will be remembered that, of the 100 autopsies cited above, in 13 of them there was a limited abscess associated with general peritonitis. The latter was believed, in many of these cases, to be due to a giving way of the soft adhesions circumscribing the original abscess. Furthermore, there are the risks of portal phlebitis with external or internal suppuration of the liver, and pyæmia to be encountered, the longer the pus is retained within the system.

Therefore the rule has been laid down, and in my judgment it is a wise one here, as elsewhere in the body, that as soon as pus is recognized it should be evacuated. Whether a surgeon should

[1] A Plea for Earlier Operation in Perityphlitic Abscess. Weir: Medical Record, June 11, 1887.

resort to measures for determining the presence of pus, such as the use of the aspirating needle or the making of an exploratory incision, will in any given case depend upon the condition presented by the patient. In other words, if the disease be acutely progressing, the surgeon will at once be called on to decide whether the patient will incur most danger from the progress of the disease or from operative interference.

In the case of a slowly progressing tumor without any or with slight peritoneal symptoms, or with those which may have passed away, or ameliorated within twenty-four hours, one need not always feel obliged to hasten to determine whether pus is present or not. The likelihood of there being simply some exudative fibrinous process is quite as great. I have myself been accustomed to keep such patients under careful observation for three or four days, and bide my time until some elevation of temperature, some chill or sweating, or some increase in the size of the tumor indicates that more than such an exudation is present.

I am sometimes compelled to take this course in the earlier days of attacks of this sort, even when unwilling to do so, by the wishes of relatives, or by that more commanding objection, the reluctance, positively expressed, of the attending physician to consent to the employing of surgical measures. I have so far not been able in these milder cases to operate earlier than the fourth day, though my inclination leads me more and more to diminish the period of delay. In those cases, however, where there are decided symptoms of peritoneal involvement over a considerable area, and after such marked symptoms have had a duration of twenty-four hours without any subsidence and are associated with the concomitant symptoms of vomiting and elevation of temperature, then I believe we are justified in interfering without further delay, whether a tumor be present or not. If a tumor, however, does exist, then the question of the advisability of aspiration may be raised, and if decided on this may afford another evidence of the necessity for an immediate operation.

The value of this means of exploration is more commonly realized in those cases where the disease has existed more than forty-eight hours. The needle is usually introduced at a point just over the site of the appendix—that is to say, almost an inch and a half above and nearly the same distance inside of the anterior superior spinous process—and is then carried backward or downward toward the appendix; or it may be thrust inward, and somewhat downward at a point just above the middle of the crest of the ilium, hoping in this latter direction to detect an abscess that may run upward in the right dorsal gutter, and which is erroneously spoken of as being extra-peritoneal in character or of a peri-nephritic location.[1]

I may insert here (as it has previously been omitted) in this connection, that in the one hundred autopsies referred to in the early part of this paper there were seven instances where abscesses had formed in this region, *all within the peritoneal cavity*, and that in two of them the purulent matter had advanced as far as the posterior part of the liver, being limited internally by adherent intestines. Individually I believe that the abscesses of perityphlitic origin which are here found are located primarily, if not during the whole course, in the peritoneal cavity.

Concerning the usefulness of aspiration it must always be kept in mind that, while its employment may reveal the existence of pus, a failure to draw out this through the needle does not prove that pus is not there. Its use, moreover, is attended by some slight risk. When employing it in cases where a tumor was only suspected or could not be clearly and definitely made out, the thought has often come up to my mind that the point of the needle might perhaps perforate a distended bowel. This probably is not of any great matter unless the distention exists to a considerable degree, but the possibility of its doing damage to a normally situated or to a displaced iliac vessel, vein or artery, has often occurred to me. In order to avoid the risk of an extravasation of fetid pus that may come on from this exploration, into the peritoneal cavity, or along the track of the needle through the muscular tissue of the abdominal wall (the occurrence of which I have demonstrated in two instances), I prefer always to follow the revelation of the presence of pus by the needle by making the required incision at once.

I think in our present status that it will go without saying that in those instances in which there are signs of spreading or purulent peritonitis (even though no tumor is recognized in the iliac fossa, either by the ordinary examination or with the patient under anæsthesia) immediately laparotomy is demanded from the nature of the case, provided the general condition of the patient is not too much weakened by the practitioner's delay.

In the first-named variety of abscesses—the milder form of the disease—the incision can, as a rule, be made over the most prominent portion of the tumor; or, in general terms, parallel to Poupart's ligament and running along its outer part and the anterior portion of the crest of the ilium. If the abscess runs further backward the incision is carried in that direction also. In some few instances, as in the surgical treatment of a supposed circumrenal or

[1] A case (read as this proof is corrected) has recently been reported by Coupland in the British Medical Journal, March 23d, where a perityphlitic lesion had caused a subdiaphragmatic abscess.

hepatic renal abscess, the incision must be made vertically or obliquely in the space between the crest of the ilium and the ribs, or in the subdiaphragmatic form along the ribs, or possibly through the pleural cavity itself. But in those cases where there are evidences of spreading peritonitis with or without the presence of a tumor, it is much better to make a tolerably extended incision along the outer half of the right rectus muscle, the upper end of which should reach to the level of the umbilicus. After the muscular layers are divided the surgeon can readily recognize when he comes to the peritoneum. If the tumor is a large one, which is rare in the early stage of the disease, he may now see some evidences of œdema of the extra-peritoneal tissue, or even find the matter has broken down this membrane and has invaded the abdominal walls, but usually nothing is visible till the peritoneum is cut through, when one of three conditions may present itself.

First. A mass of œdematous, opalescent exudation of varying thickness, sometimes half an inch or more in depth, may be observed. On cutting through this he may come down into an abscess cavity large or small. This condition is likely to be found in the more slowly progressing troubles of the vermiform appendix, and it particularly belongs to those cases in which there have been previous and not very far distant attacks of appendical inflammation.

Second. The parietal peritoneum may be found normal, or perhaps adherent to the adjacent coils of intestines by a few recent adhesions. On gently pushing through these latter, if such exist, a firmer resistance may be encountered, and on boring through this with the point of the finger the cavity of the abscess is opened. If the parietal peritoneum and the adjacent intestines should be apparently free from adhesions, and yet an abscess be recognized by a tumor, though at some distance from the surface, it can be opened, and entered in the same manner by the finger. When this form of a more deeply located abscess is observed, it is wiser freely to enlarge the incision in the parietal peritoneum and to push away the interposing intestines, until warned by adhesions that the abscess is being approached, when the free peritoneal cavity can in a quite perfect manner be protected from the irritation of the pus that is about to be evacuated, by first packing the cavity with sponges or iodoform gauze; after this the abscess may be opened. I may, however, here remark that the septic influence of such pus on the adjacent intestines, in the cases that have come under my own care or observation, has been entirely absent, and this is contrary to what has been theoretically stated by those who oppose an early operation for the relief of these abscesses.

Third. There may, finally, be found on the immediately presenting loops of intestine next to the parietal peritoneum (or it may be encountered in the region of the cæcum), pus in moderate quantity and not encysted, or purulent lymph smeared over the intestines. An exposure of the appendix, which is usually easily done in these cases, may show indubitably that it is the seat of the trouble, being either inflamed, perforated, or gangrenous; and the further exploration by means of a sponge on a long forceps carried into the pelvis or into the dorsal gutter of this side may reveal that we have to deal with a general suppurative peritonitis.

As a direction common to all of the above conditions save the last, it may be said that if the surgeon encounters a limited abscess and opens it, it is further treated simply by introducing a drainage tube, and possibly by a partial closure of the abdominal wound and the usual antiseptic dressings.

I have already stated the objections to washing out or freely exploring such cavities. I can also see only danger in all the attempts that have been made by some to search for and to remove either the concretion that has produced the perforation or the perforated appendix itself. If the appendix should, however, be exposed and be readily accessible, it is proper to tie it off by a stout silk ligature. No fear need be entertained of a permanent intestinal fistula in any form of abscess, even where its contents smell strongly of feces, or even where there is a more or less decided flow of the contents of the bowel from the cavity for some time after the operation.

Furthermore, while not in a position to make the statement with positiveness, I have been strongly impressed in my investigations by the fact of the rarity of recurrence of perityphlitic abscesses that have been relieved by operation and where no interference with the appendix had been resorted to. This seems to support the advice just given, not to strive too zealously to get away the appendix. It is reasonable to suppose that the cicatrization of the perforation, occurring, as it usually does, in the upper part of this tube, obliterates its lumen so as to form a permanent safeguard against a recurrence of the disease.

On General Suppurative Peritonitis.—As has been stated, an exploratory operation, conducted in the manner just described, may reveal that the peritonitis has invaded the peritoneal cavity to an extent much wider than the iliac fossa. This spreading inflammation shows itself in two forms, to which I am disposed to attach some clinical difference in importance. One, with the ordinary lymph exudation, with occasional small depots of matter, or with moderate layers of liquid pus bathing sundry sparse coils of intestines, with its focus of intensity in the right iliac fossa. This form is often associated with both completely and incompletely circumscribed abscesses. And in another form, where there is comparatively a scanty amount of plastic exudation,

and where the intestines are bathed over a great extent with a thin layer of pus, which, however, is but seldom encysted, and in which pus is found in considerable quantities in the pelvis or along the dorsal gutters.

This latter form is, to my mind, the most intense, most fulminating, and most septic form of the disease, and is frequently met without any attempt at a circumscribed abscess, or, if so associated, the latter is small and has early burst its barriers. Prior to operation this kind of peritonitis can sometimes be recognized by puncturing through the abdominal wall with a hypodermatic needle in other places than in the right iliac fossa, or by a hypogastric puncture made deep in the pelvis, the bladder being first emptied. Whether these differences in inflammatory action, the result of a perforation of the appendix, are due or not to the amount of fecal or gaseous extravasation that takes place, is somewhat difficult to determine, but the experiments of Pawlowsky[1] seem to support this view. This observer has found, experimentally, that in the peritonitis resulting from perforation of the intestine, a peculiar germ, called by him the bacillus peritonitidis, is usually found, and that cultures of this bacillus brought death, when injected in animals, in from twenty-four to seventy-two hours, with the production of a fibrinous, purulent peritonitis. Where the disease lingered a little longer the peritonitis was purely a suppurative one.

In 6 cases of suppurative peritonitis of a marked character, coming from a perforated appendix vermiformis, and not included in the 26 previously referred to, that have been treated by me by laparotomy, in all was the lumen of the appendix sufficiently large—up to its origin in the cæcum—to have permitted of a free escape of the irritating contents of the intestine. This patency of the appendix I cannot but think must have an influence on the severity of the disease. In health and in disease its lumen greatly varies. Kraft[2] has also suggested that differences of severity might be ascribed to variations in the mobility of the appendix; that, for instance, where it was short, as with a scant mesentery, or was confined by some previous adhesions, a more limited inflammation might be expected.

While some observers have advised for a recognized suppurative peritonitis that the treatment required should be carried out through the lateral exploratory incision, I have myself, in two instances where it was practised in this manner, found myself somewhat hampered by the limitations of this incision, and therefore prefer to make, in addition to the exploratory one, a median incision, believing that this more commanding section expedites the treatment and renders it more certain. The lateral incision can be subsequently utilized for drainage purposes and for the special treatment of the appendix itself.

The median incision is also to be advised from another standpoint which has lately come home to me. In two instances I have observed that though the sponge introduced in the pelvis drew out pus through the lateral exploratory incision, yet the further carrying out of the treatment of cleansing the abdomen, etc., showed that the general cavity had not been invaded throughout its whole extent until the surgical manipulations had been employed, and that, had a median incision been made, one might possibly have been able to recognize and evacuate these abscesses, of unusual size and with slight limiting adhesions, without exposing the patients either to the risk of infecting the only moderately damaged peritoneum above, or, what was more important, might have spared them the exhaustion consequent on the necessity of a prolonged toilet of the abdominal cavity. Hence, it has now become my rule, after the resort to the lateral exploratory incision has demonstrated that no collection of matter is here present, and that the symptoms there or elsewhere found point to a possible invasion of the general peritoneal cavity, to resort to a median incision opening into the cavity rather high up, and carefully to enlarge it downward as may be required. Such abscesses can sometimes be recognized and treated per rectum, which, therefore, should always be examined in a case of perityphlitis or any form of peritonitis.

If, after all, a veritable general suppurative peritonitis be encountered, we have one of the most discouraging lesions in the whole of surgery to treat. Whether we resort to the sponging out of the pelvic cavity or dorsal gutters, a very exhausting procedure, or whether this cleansing is effected by repeatedly filling the peritoneal cavity with boiled water, or with a solution of salicylic acid 1 : 1000, or other non-poisonous antiseptic solutions, or whether it be accomplished by the less irritating means of irrigation with one or two glass tubes carried down to the bottom of the abdominal cavity in various directions, according to Tait's suggestion, and however thoroughly, however quickly this end may be accomplished, and however satisfactorily we may place our drainage tubes, say one in the pelvis, one out through the lateral incision down to the stump left by the removed appendix, the difficulties of the case are but half encountered.

No delay need be made in this part of the operation, or, indeed, under any circumstances, by endeavoring, after cutting off the appendix, to cover the remaining end by peritoneum, as Treves has sug-

[1] Beiträge z. Aetiologie und Entstehungsweise der akuten Peritonitis. Centralblatt f. Chirurg., No. 48, 1887.

[2] Ueber die frühzeitige operative Behandlung der durch Perforation des Wurmfortsatzes hervorgerufenen Perityphlitis stercoralis. Samml. klin. Vorträge, No. 331.

gested. Surgical experience is sufficiently great, here as well as in the removal of the gall-bladder and in ovariotomy, to show that this is unnecessary. Granted that the patient's strength, already wasted by the disease, enables him to tide over the shock of an operation of this character, there remain after the closure of the wound dangers which thus far our surgical art has not yet learned to overcome.

Out of twenty-five cases of this description of general peritonitis arising from perforation of the appendix vermiformis, but one has, so far as I have been able to learn, been saved. Two doubtful cases[1] have been recently classed in this catalogue, but a closer reading of their histories seems to point more toward the spreading exudative form of peritonitis with a circumscribed abscess than to the true suppurative type; but even these should be considered as triumphs of surgery.

In my own six cases of laparotomy for this disease in its well-marked form, death has ensued in every instance, either from the shock of the operation, that is to say within twelve hours thereafter, or from the persistence of the symptom which exists nearly always before the operation—I mean fecal or fecaloid vomiting, the matters vomited being always of a yellowish or creamy-brown color, but not always having a fecal odor attached to them; a condition which, beginning as the ordinary green bilious vomiting, thence changing to the above character has been so frequently proved to me by autopsy in connection with intestinal stenosis where no peritonitis existed as to convince me that its significance is always that of obstruction, though it is true this obstruction may be caused by peritonitis. This obstructive symptom is due, as the interesting investigation of Malcolm[2] has shown, to paralysis of the muscular coat of the bowel occurring from the overstimulation of the nerve-plexus of Auerbach which supplies it. Operative procedures of themselves sometimes occasion this paralysis, but septic influences are the most potent causes.

Sometimes obstruction is produced by the pressure of the distended coils on an adjacent part of the bowel.[3] This has been found not rarely in post-mortem examinations. Irregular contractions of the bowel, due to septic irritation of the muscular coat, are also found. It is this absolute paralysis of the intestine which constitutes, in addition to the general poisoning of the system, the great danger in these cases. And while the success of the early use of purgatives in the lesser forms of obstruction after ordinary laparotomies has only confirmed Mr. Tait's eulogy of this method of treatment, yet in these marked septic forms of peritonitis his treatment utterly fails. It is the exception to succeed in bringing about purgation, use what you will, whether salines, mercurials, or the washing out of the stomach.

In the three of my cases wherein the duration of life after the operation was prolonged sufficiently to enable me to undertake the trial of every method to overcome the obstructive symptoms, nothing brought about a discharge from the bowel save in one instance, and in this to but a slight extent. Moreover, in one case, as a last resort, it seemed proper to me to open one angle of my abdominal wound and to draw out the first presenting distended loop of intestine, at that time shut off by adhesions from the general cavity, and open it. But a scanty amount of fluid feces came out of the artificial anus thus formed, and without any marked relief to the patient. Also in one of Duplay's cases a tube was introduced through the perforated appendix into the colon without any benefit resulting therefrom.

In the autopsy of all of these cases (and this remark is only of value in the three who lived beyond twenty-four hours) there was but very slight evidence of fresh peritonitis, yet the temperature had kept up so high throughout as to corroborate the belief that no matter how thoroughly one might wash or cleanse the peritoneum during the operation, much septic material must be left in the various patches of exudation or in the inaccessible nooks of this cavity, to perpetuate the infection raging in the general system.

I had been much struck with the remarkable results witnessed in the wards of Mr. Treves in the treatment of suppurating disease of the knee-joint, by continued aqueous irrigation for a period of nearly a month, with the effect of securing a perfectly movable articulation, and had determined, in the next case of suppurative peritonitis presenting itself to me, so to arrange an entering tube, lodged in the pelvis, and a smaller emergent one in the upper part of the abdominal cavity, as to conduct a continuous stream of boiled or salicylic water through these for a number of days, and thus to secure, at least for a moderate length of time, a hyperdistention of the cavity, and a thorough dilution of its poisonous contents.

This idea, I have already learned, has been put into effect by Penrose, of Philadelphia,[1] who used on one occasion two glass tubes placed in the pelvis, and one large tube running from the epigastrium to the lower angle of the abdominal incision. The irrigation was not, however, continuous, but the abdomen was flushed with warm water every two hours for twenty-four hours after the operation, with a successful issue to this case of suppurative

[1] Those reported by Drs. Sands and Jacobus.

[2] The Condition and Management of the Intestine after Abdominal Section, considered in the light of physiological facts, by John D. Malcolm. Med.-Chir. Trans., vol. 81, 1888.

[3] Verchére: Septicémie Intestino-Peritonéale. Revue de Chirurgie, July, 1888.

[1] Intestinal Obstruction in its Surgical Aspects. Journ. Amer. Med. Association, July 14, 1888.

peritonitis with gangrenous patches on the sigmoid flexure.

Greig Smith[1] and Wylie also announce that they have used this repeated peritoneal flushing with advantage. Clinically, however, it must be admitted that such hyperdistention of the peritoneal cavity and ablution of the intestines can be carried on but a short time, as experience with the ordinary drainage tube shows how rapidly the general cavity is shut off by adhesions.

In concluding these remarks it must be again placed prominently forward, that though laparotomy for general peritonitis following perforation of the appendix has had most discouraging results, yet that in nearly every case in which it has been so performed the disease had existed, on the average, nearly three days, the shortest time being thirty hours. Pawlowsky's experiments, and my own operations and those of others, tell us that the delay is an all-important fatal factor in these cases. Where the agonizing pain that ushers in often mild as well as severe cases does not yield to opium, and the vomiting does not cease, and particularly the temperature does not fall within twenty-four or, at the most, forty-eight hours, then promptness of surgical action is required. Much less time should be allowed if the pain spreads, and other symptoms aggravate in severity. The query is, whether the prospect of an early laparotomy is a better one than the chance of a limited abscess forming. This latter is not a large one. My own collection of autopsies shows that a patient has about twenty-five chances in a hundred in his favor.

I venture, therefore, in terminating this paper, to present the following conclusions, based on observations of 100 post-mortem examinations and from 32 personal operations for so-called perityphlitic abscesses:

I. That all such abscesses originate in the peritoneal cavity, and there develop to an appreciable size before invading extra-peritoneal tissues or viscera.

II. That as stercoral accumulations or cæcal perforations are so rarely met with as causes of perityphlitic tumor or abscess, they should not be considered from a clinical view in any given case.

III. That in an attack of perityphlitis originating, as it generally does, as a perforation, or as a gangrenous condition of the appendix vermiformis, all use of purgatives or enemata is in the beginning of a case to be avoided, and the immobilization of the patient is to be insisted on, and aided, if necessary, by anodynes.

IV. That if a tumor be found, it be opened by a lateral incision as soon as symptoms, constitutional or local, indicate the formation of pus.

V. That if symptoms indicating an increase of the local peritonitis, such as the persistence of vomiting, spreading pain, abdominal resistance, and temperature elevation, continue, with or without the formation of tumor, for a period of forty-eight hours, the danger of the disease is greater than the proposed lateral or median laparotomy, which should then be immediately resorted to. In many instances even a less time should be afforded the consideration of the disease before operating.

VI. If a general peritonitis be suspected, corroboration can often be obtained by abdominal aspiration with a fine needle employed in places other than in the right iliac fossa, and particularly by a deep, hypogastric puncture into the pelvis, the bladder being first emptied. However, if left in doubt, it is better to operate.

VII. [*Sub judice.*] That if general suppurative peritonitis be found at a laparotomy, lateral or median, avoid too much handling of the intestines, and trust to either temporary irrigation with large glass tubes (Tait's), or, more rationally, to permanent or repeated irrigation and fluid distention of the abdominal cavity, as advocated by Greig Smith and by Penrose.

VIII. [*Sub judice.*] To meet the obstruction symptoms due to septic paralysis of the bowels, which often persists after a laparotomy for suppurative peritonitis, saline purgatives and repeated washing out of the stomach should be resorted to, even though vomiting be present to a marked degree. Enterotomy may also, in exceptional cases, be entertained.

[1] Abdominal Surgery, 2d edition.

THE EFFICACY OF FILTERS AND OTHER MEANS EMPLOYED TO PURIFY DRINKING-WATER.

A Bacteriological Study.[1]

BY CHARLES G. CURRIER, M.D.,
OF NEW YORK.

(Concluded from page 431.)

ALLIED to the porous stone filters are those of porous porcelain prepared in this country. Porcelain baked at the same low temperature as the porous cups used in electric batteries is, in its efficacy, very much like the stone just described. Under a low pressure, water passing through this substance during one or two days can become completely sterilized, which is a result superior to that got from the stone filters. Before much water has passed, the bacteria make their way through and multiply somewhat on the passage. This material, as I have thus far found it, of American manufacture, is therefore imperfect, yet is superior to rebaked porcelain in the single important respect that it is not brittle, while the rebaked porcelain cylinders of the Chamberland-Pasteur filters are quite fragile.[1]

[1] It has for some time been known that fluids can be rendered germ-free for laboratory use by being passed through solidified plaster-of-Paris (best prepared with incorporation of asbestos

Recognizing the defects of other substances, Pasteur and Chamberland[1] called attention to their filtering cylinders, in which the important element is unglazed, rebaked porcelain. Originally employed to facilitate "cold sterilization" of fluid culture media, the fact that water went through the porcelain without carrying any bacteria with it has caused attempts to popularize its use. Inasmuch as some bacteriologists on both sides of the Atlantic had reported that this filter prevented the passage of bacteria, I was careful to use only selected cylinders without flaws, and did not omit any precaution to prevent the introduction of contaminations.

The most satisfactory way of using this for testing was to employ the single porcelain cylinder, within the usual casing, attached to a hydrant system and with a pressure of water varying from six to fifteen pounds.[2] Even with the highest New York hydrant pressure the flow is only drop by drop. It can be used to siphon water out of a jar, and in this way it works nearly as rapidly as when attached to the hydrant in the basement of a house in the centre of this city. By a porcelain cross tube sold in Paris, two or more cylinders can be siphoning at the same time into the same tube. To avoid risk of contamination, I used for siphoning a single cylinder, to which a bent glass tube was attached by a tightly-fitting piece of rubber pipe, all parts having been sterilized as well as the water by which the flow of the siphon was started. I got germ-free results regularly by this means in seven trials with two cylinders used separately;[3] but, in order to insure this, all the precautions mentioned are necessary as, in the water siphoned in domestic use of these cylinders, bacteria of various sorts are found, yet they are possibly contaminations due to the inherent defects of all such joints as are used. So I have devoted more time to testing these when directly connecting with the hydrant, as very slight precautions are needed, in their use with faucets, to eliminate all chances of contamination.

My first thirteen trials of this filter used in this way were under less satisfactory conditions than the fourteenth and those following, as the former were in a laboratory where the available water came under not much more than twenty feet pressure from a tank, and I was not able so well to control the constancy of this pressure as I was during the later trials. My first sixteen tests of various ones of these cylinders gave sterile water. Then, attached to a basement faucet, with a direct flow from the hydrant under a pressure never exceeding fifteen pounds (except that on Sunday nights it was for a few hours three pounds higher), the filter, after several days of intermitting use, gave over 3500 bacteria in each cubic centimetre and all the water examined (two samples per day) for four days showed an increasing number of bacteria.[1]

On the third and fourth days after the first passage of bacteria through the porcelain wall of the cylinder, the number in each cubic centimetre varied above and below 400,000. The filter was then sterilized by steaming for five hours, as was also done between the second and third series of tests. These tests bore out the results of the former observation.

That these results show that average specimens of this substance have the inherent defect of all filtering material, though in a much less degree than all others, seems to me unquestionable. That the bacteria did not get through owing to some defect in the particular filters which I used is evident from the fact that the cylinders employed (and which were selected by me in Paris as perfect), through which the bacteria passed, are still free from any appearance of a flaw which could explain the passage of these micro-organisms. The same filter which (first of those used in my tests) allowed bacteria to pass through, has repeatedly filtered water free from all bacteria for a few days after each of the several sterilizations which it has since undergone.

In three following series of trials of this identical cylinder, bacteria have gone through its walls in from three to four days after each sterilization. They have also gone through a second perfect cylinder with which I experimented. That the bacteria were not introduced by careless manipulation is evident by reason of their number, and because of the fact that, after the filter was sterilized, they were found in each case at a particular phase of each series of tests with the intermittent pressure which only for a few hours once a week was as high as eighteen pounds, and was usually as low as eleven. At the beginning of each series of tests the filter was sterilized.

The bacteria were not splashed in from the sink below, for, in the first place, all splashing failed to carry in any as revealed by testing the water filtered

shreds). These filters, however, lack permanency and cause the objectionable sulphate of lime to be present in the filtrate

[1] Bouley (for Chamberland): Comptes Rendus de l'Acad. des Sciences, 4 aout, 1884.

Chamberland: Comptes Rendus Hebd. (etc.) de la Société de Biologie, 1885, p. 117.

Immediately following this (*idem.*, p. 120) were reiterations of adverse criticisms by Galippe and Bourquelot.

[2] This highest pressure was only at night, and once on Sunday night the pressure for a short time was three pounds greater. During the daytime the pressure was rarely more than ten or eleven pounds, but occasionally the gauge vibrated a little higher on account of the concussion of the water while a neighboring pump was working. The pressure was tested by an expert, and was only half of that indicated on the French circular of the agents of this filter in Paris as yielding 200 litres (50 gallons) per day.

[3] One cylinder being used three times, and another four times, each being carefully sterilized before each trial.

[1] The varieties first passing through were:

1. Colonies liquefying gelatine, and composed of medium-sized very mobile bacilli.

2. Superficially-spreading colonies of short, mobile bacilli.

after such experimental attempts to throw water in, and none had ever multiplied inside or even remained there during my first thirteen tests, when there was much splashing in the common sink. During my later trials there was no chance of such contamination.

To answer fully in advance any such objection, I will state that after I got the enormous number of over 400,000 in each c. c. flowing through the porcelain, and had sterilized the cylinder, water was allowed to flow through it and plated, but was sterile in that no bacterial colonies developed. Then, while the filter was in action, I introduced, with a sterile needle (from below through the aperture into the inside of the cylinder), and, touching the needle to various parts of the surface, deposited over it peculiar bacteria from a pure culture derived this winter from the water of one of the northern lakes which I examined during my investigations as biologist for the Syracuse Water Commission. The colonies of this bacillus, when growing on gelatine plates, have a peculiar odor, a distinctive green color, and other characteristics which clearly differentiate them from any bacteria ever found in the Croton water. The water flowing out all the while, or rather dropping out, was, three minutes after the introduction of these, collected in sterilized test-tubes and was found to contain 175,000 of these peculiar bacilli in each c. c. After seventy-five minutes there were only 14 bacilli in each c. c. of the water then flowing through the porcelain and two hours later, and during the next day, there were no bacteria of any kind in the water which again later in the series showed that the Croton bacteria had passed through with it. This proves that the increase in the number of the bacteria was not after the water had passed through the substance of the filter.

These facts, together with the extreme fragility of this rebaked porcelain, and the exasperating slowness of the flow, which does not improve on long trial, have caused me to modify the recommendations which I gave among my colleagues and others after my first tests of these filters.

As regards rapidity of flow and non-fragility, a notable improvement over the cylinder form (which I have just spoken of) is afforded by a series of two or more flat plates of porcelain similarly prepared. In the Varrall-Brisse pattern these porcelain plates are backed by carbon plates of the same shape and size and the filter yields sterile water for a long time under gentle pressure, although I do not consider the carbon an advantage. The further such filters vary from the simplest type, the greater is the likelihood of the introduction of contaminating bacteria into the filtered water.[1]

Of the various forms of filters used upon faucets, I feel bound to warn against those rotating within an outer shell. Whether packed with charcoal, sand, or any other material, and even if the water go through the filtering mass and not around it, the filter has the great drawback of various irregularities and depressions on the interior which retain organic matter and allow bacteria, both harmful and harmless, to increase in it and maintain their vitality for a longer time than in ordinary filters. This conclusion I am led to by the results of various experiments and observations. In a recent epidemic in a large New England city this form of filter appeared to play an active part in continuing the infection, for cultures, in every respect like those of the germs of typhoid fever, were derived from several of these suspected filters by Dr. Prudden and others. I have found that the typhoid bacillus lives much longer in the sediment collected from filters than in pure water.[1] At its best, this filter cannot remove the bacteria from water, and they multiply in the charcoal or sand so that, even after several minutes of washing out by the stream flowing from the hydrant, the water coming through this filter may show several times as many as are in the water directly from the hydrant. To avoid waste of time in repetition, I will refer to the facts observed with the sand filter, as the mechanical action of the filtering mass is identical in both.

The sand filter, for attaching to faucets, is perhaps the simplest and most popular used. It consists of a cylinder of like breadth and length, being not quite three inches long. It screws by either end upon ordinary faucets, and its interior is filled with crushed silica or fine sand, kept in place by wire-gauze at either end. I have adapted several much larger without securing more satisfactory results. Taking a new one, sterilized throughout, allowing a fair stream of water to flow through it when attached to

[1] As out of twenty-seven kinds of filters that I have been able to test, this seems, on the whole, the best substance yet produced for the purpose, it is to be hoped that American ingenuity make further improvements upon the models now existing. The cost need not be great even if all be carefully tested before being sold, as suggested by Fol and Dunant (Rev. d'Hygiène, 21 mars, 1885, p. 183).

The "Pasteur Filter Co." requests me to state that it now furnishes a slightly different style of cylinder in which the porcelain is invariably of fine quality and claimed to be "germ-proof."

[1] I have removed the slimy sediment from the outside of a porcelain filter, and without sterilizing this, put it into sterile test-tubes, and then added water in which the germs of typhoid were found living. After these had stood together for four weeks, several plates of the water were prepared and, making several cultures from the various colonies which appeared like typhoid, a bacillus identical in all its features with that of typhoid was isolated, and considered as typhoid by those to whom it was shown. This is longer than I have been able to keep this bacillus alive in pure Croton which had been sterilized. All waters tested were in tubes of the same size and at the same temperature. In laboratory experiments we are not able to reproduce the conditions existing in the large bodies of water, where these harmful bacteria can probably live longer still under the evener temperature there prevailing.

a faucet and at the same time taking water directly from the same supply-pipe from the hydrant by means of another faucet by its side, and under the same conditions of pressure and outlet, except that there is no filter upon the second faucet, the water is seen to flow in a free stream nearly as large as from the unobstructed faucet, while the Pasteur filter, attached to the same supply-pipe and with the same pressure, allows the water to come at the rate of only a few drops each minute. Even with a gentle stream through the freshly sterilized sand filter, very few of the bacteria are arrested. With very fine sand in a cylinder holding three times as much as the ordinary one, and a very small stream flowing, I have observed more than fifty per cent. to be retained. This result is seen only in the first use of an absolutely sterilized filter.

Speaking of the tank variety of sand filters, it was shown that moistened sand favored the increase of bacteria brought into it by Croton water which had flowed through. In the sand or other granular contents of these filters attached to hydrants the same multiplication takes place when the water has for some time ceased flowing, and this increase is at a more rapid rate than in water standing in a clean vessel by the side of the filter. The first flow in the morning, for instance, after the filter has remained unused over night, shows a much larger number of bacteria than the hydrant water then contains. Even after the water has flowed for several minutes for the purpose of washing out the filter, the bacteria are in excess over the number in the original water. After such a filter has had the hydrant stream running through it long enough to wash out all the germs that have resulted from the increase (which complete cleansing is not always producible), the bacteria in the water may appear nearly the same in number as in the hydrant water, varying slightly either above or below. While such filters are worse than useless from a bacteriological point of view, they are good strainers when not clogged by too long use without cleansing. As strainers they are less troublesome than flannel bags (which are as safe as these sand filters for use with suspected water, provided that they are removed at least once a day to be disinfected by boiling). The act of reversing this popular sand filter does not cause the removal of the organic matter upon which the bacteria can be nourished. Only the loose outer portion is thereby removed. Such a sand filter is a safer strainer when never reversible and it should be cleansed at least once a day when needed at all.

Powdered magnesia and other granular substances used instead of sand in the style of filter just described, have no superiority over the easily cleansed sand.

Asbestos-board I have not been able to procure of sufficiently firm, strong, and fine surface to resist the passage of bacteria under any considerable pressure from the hydrant brought to bear upon such a surface. The quality of the surface seems the important point. To yield a flow of any degree of rapidity, this surface must be large and that creates a tendency to break and necessitates a bulky filter, which most people shun. Packed asbestos shreds allow a few bacteria to pass through when the sterilized filtering mass is so dense as to cause the flow to be very slow. In this substance I have, as already mentioned, not observed so marked multiplication of bacteria as in the sand, porous and other filters.

Although large bodies of sand fail to prevent the passage of bacteria with the water which percolates through, it is noticed that certain natural filters of this sort render water much freer from bacteria when the water has first to make its way through a layer of silt and minute particles which have been arrested by fine sand. It is from the application of this principle that the large filter-beds are built which purify the water distributed by hydrants throughout various cities. Taking as a model the very carefully managed filter-beds of Berlin, it is seen that above the base of the filtering tanks is a layer of a foot of stones, gradually becoming smaller in size toward the upper surface, upon which is coarse gravel to the height of a foot more, then upon this a little more than two feet of sand, which at the top is as fine as can be procured. When the filter-bed has been freshly cleaned, as is found necessary for it after being constantly used for a week or so (occasionally several weeks), purified water is slowly backed into the filtering-mass from below until this water, carrying up all the air with it, has reached the top of the upper layer. Then the ordinary river (or lake) water is made to flow very gently in, to the depth of one metre. This is then allowed to stand for at least twenty-four hours. The nitrogenous or other particles, confervoid vegetation, and whatever else the water contains as sediment, have then settled upon the upper portion of the fine sand without sinking deeper, and a delicate film is formed which, with careful inlet and gentle pressure (never to exceed two metres of water), retains nearly all the bacteria of the water supplied, and prevents their passage, provided that the flow through is very regular and slow (never more than three metres in a day). Nearly all this separation of the bacteria is produced by the sedimental matter retained on the surface of the sand, so that, when the filter slows from clogging, it is found that less than half an inch of the upper layer of sand need be removed.

From the statistics of Wolffhügel[1], and of Plagge and Proskauer,[2] we learn that the number of bac-

[1] G Wolffhügel: Arb. aus d. Gsdamt., ii. 1 und 2, p. 109.
[2] Plagge u. Proskauer. Zeitschrift f. Hygiene, 1887, ii. p. 401.

teria, originally very large in the river Spree, is reduced to a very small percentage in the filtered water, oftentimes a fraction of one per cent. I may add that the organic constituents are also decidedly lessened, and that the oxidibility, as tested by the reduction of a standard solution of permanganate of potash, is seen to be regularly lowered one-fourth and often one-third of the amount shown prior to the filtering. The long arrays of figures given in the reports of the action of these filter-beds show that, with hardly an exception, the ammonia is constantly removed by the process.

In this country the filter-beds, all of which are built upon the same plan as those in Berlin, are less perfect in their action, as the people in charge do not devote sufficient care to sedimentation in the case of those which I am familiar with. Thus, a very carefully planned filter-bed, which filters river-water for one of our cities, allowed, at the time when I examined it, nearly half of the large number of bacteria in the water pumped from the river to pass through. This unsatisfactory result seemed to be due to the fact that too much water was required from the small filter-beds and hence not enough care could be bestowed upon the thoroughness of the filtration.

Of the various large filter systems which I have tested while they were in use in various manufactories and institutions, for which these filters were straining large quantities of water, the only kinds which reduced materially the number of bacteria as found in the hydrant-water were those in which, by the addition of a minute proportion of a suitable salt, usually alum (as approved by the general experience of years in many districts), the suspended particles with the organic matter are caused to settle more rapidly, and then these form a deposit upon very fine sand, through which water is forced. From several examinations of a filter of this type, which in every case rendered the water much freer from germs than the original (unfiltered) water, I once found the filtered water wholly sterile, while the (Brooklyn) hydrant water of the neighborhood at the same time showed 397 germs developing from each c. c. This particular filter was constructed on the principle of Prof. A. R. Leeds, who informs me that the alum was present in the proportion of only 1 part in 100,000 of water. I could not, by the ordinary tests, detect the presence of this salt, and such a small amount can cause no appreciable harm. The alum used is probably decomposed, and its elements taken up by the organic matter and bases present. As previously stated, the sterilization of the water is here caused by mechanical and not by chemical action. In my tests the typhoid bacillus of the first agar culture from a recent spleen was not destroyed by standing for forty-eight hours in a solution of ten times the strength of that employed in these filters, while many other bacteria were alive after standing for forty-eight hours in an alum solution of 1 part to 1000 of water, which sufficed to destroy the typhoid bacillus in that time.

In the present stage of chemical knowledge there seems no sufficient evidence that in water these micro-organisms evolve the organic alkaloids which are considered to be produced when harmful bacteria are introduced into the system and by their action there cause disease. What the exact nature of the volatile organic constituents carried over in distillation may be, and whether they be deleterious or not, rests for the science of the future to determine. The process of boiling previous to vaporization in the still must kill all harmful bacteria, and all other bacteria that I have ever encountered in the original hydrant water from which such water as the well-known "Hygeia" is prepared. The bacteria which I have found in specimens of this excellent distilled water that I examined must have been introduced from without after the water was condensed from the still and before the bottling process was completed, and in this I have never found any other than harmless varieties. Water condensed from various stills of approved patterns I have found sterile. The relatively large amount of free ammonia found in such distilled waters (it being several times greater than any detected in the Croton hydrant water) does not seem to me to be objectionable. The condensed steam produced in distilling, and which constitutes the Hygeia water, represents a much larger original amount of water than results after the process of vaporization and condensation is completed, and the ammonia may besides come from the air and from other sources.

To those who desire a water freer from alkaline earths than the ordinary "hard" water which they may have to drink, it should be mentioned that the process of heating, in the sterilization by boiling which I so urgently recommend when it is necessary to drink suspected water, drives off free carbonic acid and so causes the deposition as an insoluble sediment of the carbonate of lime and other objectionable salts which form the so-called "temporary hardness." The water is thus rendered "softer."

When boiling is resorted to because of actual infection of the water, it should be carefully done. It is best to have the water, perhaps after a preliminary boiling and straining, decanted into bottles, each holding say a quart, and these covered with a suitable glass cap or plugged with cotton or provided with a clean stopper loosely dropped in, and then the bottles placed in a kettle or cauldron in the absence of a steaming apparatus. This is heated and kept near the boiling point[1] for an hour. Then

[1] Although Miquel and others have called attention to micro-organisms retaining their vitality at a temperature above 71° C. (160° F.), these seem to have no harmful character. See Glo-

the whole is allowed to cool, and the bottles may be placed near ice; but into the water thus carefully prepared it is not advisable to put ordinary ice, for harmful bacteria may retain their vitality in ice longer than in water. Pure water loses all its excellence when unwholesome ice is melted in it. For those to whom the taste of boiled water is unpleasant, weak teas, wine, or other savor may be added to mask the absence of the more agreeable taste imparted by the process of aërification (which under ordinary conditions may itself be a means of adding bacteria to the water).[1]

There are ingenious hypotheses as to the utility of nitrifying bacteria in overwhelming other varieties and conjectures that, if recognized and planted upon filters, these nitrifying ones would safely destroy the pernicious ones; but among these theories I know of none to be seriously recommended. The recent results in America and various parts of Europe are so inconclusive and diverse that the brief limits and practical aim of this paper will hardly permit any further consideration of them.

SUMMARY.—Boiling sterilizes water, and within thirty minutes will have killed harmful bacteria.

Drugs and other agents acting chemically, if used in amounts which are commonly safe, do not sterilize water.

The prolonged heat which water undergoes in the usual process of distillation destroys all germs which may be in the water undergoing the process.

Ordinary filters, even if satisfactory as strainers, fail to remove all bacteria from drinking-water. So far from lessening the number in the original water, the filtering substance may allow a more rapid multiplication than these microörganisms would ordinarily undergo in the unfiltered water on standing, and the germs of disease, even if held back by the filtering substance, may be harbored in all filters.

The finer the substance through which the water passes, and the lower the pressure, the more perfect is the action of the filter in holding back the bacteria.

Of all substances thus far furnished for domestic filters, porous rebaked porcelain, carefully selected, I have found to be the best. If thick and strong enough to allow the use of a large surface, and the substance remain perfect (without flaw or break), this may yield a fair flow of clear water, free from all bacteria; yet under our ordinary Croton pressure of one atmosphere or less, this yield is only in rapid drops, unless the apparatus be complex.

To insure the permanency of this action, the filter should be occasionally sterilized throughout, by steaming or by other means; for, under prolonged pressure, various kinds of bacteria can go through, and in the copious organic matter collected on the filter some harmful microörganisms can retain a high degree of vitality for weeks longer than I have ever found them to live in pure water.

Where filtering is really necessary, it is in general best for the community that it be done carefully on a large scale through sand-beds upon which a fine layer of organic and inorganic matter is expressly produced by sedimentation, because of its valuable action in holding back the great majority of the bacteria.

A bad water filtered is less desirable than a pure water in its natural state. When, therefore, filtration is employed because of real danger of infection, the filtered water should, as a rule, be furthermore boiled, as the entire absence of sediment and cloudiness does not insure that the bacteria of disease may not have made their way through the filter.

big (*Ztschr. für Hygiene*, iii., 2, pages 322 and 331). The spores of the "red potato bacillus," which he reports as very resistant even to steam heat, have never appeared in waters that I have seen; and the time limits for boiling which I have elsewhere given, after careful observation, hold true as regards all known disease-producing bacteria.

[1] Berckholtz (Arb. aus d. K. Gesundheitsamte, 1889, p. 14) (employing exsiccator and four days of agar culture, dried on silk thread) found that the cholera spirillum, contrary to earlier results, retained its vitality in air for over two weeks.

In connection with my experiments I have found the typhoid bacillus to live dried on the glass of a test-tube, for a week and longer. I have made no special attempt to determine how long it will live in a dry state

Tommasi-Crudeli, Dr. Bern. Schiavuzzi in Pola (Rendi Conti della R. Accademia dei Lincei, Dicembre, 1886) say with others that the malaria bacillus, which they, like Klebs, found in soil and air, may be carried by and live in water. The same is true of many other bacteria introduced into water.

A CASE OF ANTIPYRIN POISONING.

BY WILLIAM PERRY NORTHRUP, M.D.,
OF NEW YORK.

THE new drug, so efficient in relieving headaches, is, at present, so much used and so little suspected of danger, that it seems desirable to communicate a recent unpleasant experience. In speaking with different practitioners and neurologists, I learn that many times forty-five grains of antipyrin are given at one dose to an adult, and twenty-five to a child above five years of age, and they all add, "No drug is more satisfactory in its results."

The patient was Mrs. L., aged forty-four years, married, mother of three children. She had been subject to headaches (hemicrania) since childhood, but the attacks had been more severe and frequent since the birth of twins, after which she was sick in bed seven months, and, as she says "her nerves were completely upset—and her whole system." During convalescence, the patient used her eyes excessively, reading, doing fancy work, etc.

Since the twin birth, four years ago, she has been exceedingly nervous, and, as she adds, "nervous by spells," and "extremely irritable," with occasional numbness of the extremities and "lump" in her throat. At two different times in her life she

has passed over a year without an attack of headache. Immediately before the lapse of the second year she had suffered from rheumatism, and taken for its relief "salicylate." She believed the remedy had been the cure of the headaches, as well as her lameness. She has, however, since tried the remedy, and come to a contradictory conclusion.

With the two exceptions above referred to, she has usually had a headache every three or four weeks.

She has observed that over-fatigue and excitement are sure to be followed by her customary attack; also that overheating or chilling of the body provoked them, and that they came at longer intervals in summer than in cold weather. During the fall months of 1887, the intervals became shorter. Occasionally two attacks came within a period of ten days, and during the prostration of one of these quick recurring attacks I made my first observations on the case.

The patient, with the headache, lay with her eyes closed, raising her lids reluctantly and with effort when spoken to, answering questions in monosyllables, and as though irritated at the disturbance. Her face at times pale, again moderately flushed on the cheeks and pale about the lips, wore an expression speaking for itself;—"want to be left alone." Pulse was full, slow, and regular. Pupils normal in size, equal, and reacting promptly.

The headache was limited to the left hemicranium.

No remedy was administered at this time, as the attack was already beginning to wear off.

During the succeeding interval of relief, while the patient was in her best possible condition of general health, she was put to bed, and examined carefully —lungs, heart, liver, abdomen, uterus, and ovaries, condition of arteries, general circulation, accumulation of adipose, etc. Nothing was found abnormal. The patient was well nourished, free from disease, from malpositions, and from localized tenderness. She was large of frame, well proportioned, giving the impression of one with strong, enduring physique.

Examination of urine was negative—reaction, specific gravity, color, odor, and quantity; examinations for albumin and sugar bore testimony that the kidneys were doing their work perfectly. Ophthalmoscopic examination showed normal disks, vessels, and retinæ.

Was the headache, then, due to error of refraction? The eyes were examined under atropine, with test lenses, and the result was the patient was fitted with glasses for moderate hypermetropia (1.25 spherical) and instructed to wear them three weeks during waking hours. They made the vision clearer, and the head less confused while shopping and while upon the streets, but did not ward off the headaches. To remove the cause then, seemed impossible.

There yet remained the new drug, the magic remedy, "the most satisfactory drug that I know of," says one; "that I prescribe with the utmost confidence," says another. "I do not hesitate to send it to a patient at a distance, whatever the cause of the headache."

Antipyrin in fifteen grain capsules was ordered and carefully written directions were left against the time of the next attack. The patient was instructed when she felt the headache coming to go to bed, take one capsule and with it a tablespoonful of whiskey with an equal volume of water.

It happened after the usual short interval that the patient awoke in the morning with a headache of the customary kind, and without rising from her bed called for a capsule. The directions as to the whiskey were mistaken, and she took whiskey and water together to the amount of a tablespoonful. She took then fifteen grains of antipyrin with a half tablespoonful of whiskey upon an empty stomach. She felt no apprehension, no nervousness on taking the remedy; but took it rather with confidence that it would help her if not wholly relieve her.

As soon as she had taken the dose she felt "queer," that "the medicine was going all through" her, was mounting to her head; she had sense of "smelling pepper," and she began to sneeze—sneezed fully a dozen times in rapid succession. This was followed by an urgent desire to defecate: she arose from her bed to get to the commode and fell heavily upon the floor, unconscious. The next remembrance was of a sharp pain from a hypodermatic injection of whiskey in her wrist and of some one bending over her urging her to drink from a glass.

The patient lived but two blocks from my office and I was not long in getting to her in answer to an urgent summons. I found her lying on the bed, her eyes closed, her countenance pale leaden, her "jaw dropped"—in a condition of extreme general relaxation. There was no pulse at the wrist, no sensitiveness of conjunctiva, and no amount of irritation aroused her. I immediately injected twenty minims of whiskey into the first available place and shortly repeated it. The second injection caused her to move her hand to avoid the pain. In a few moments more she opened her eyes with a wild staring look and presently began to vomit frothy mucus. This "dry" retching continued more than an hour, at the end of which time the patient was nearly exhausted though clear in her mind. Her headache was not relieved.

For a week she kept close to her room feeling that for some reason the medicine had upset her digestion and that her headache, though but little prolonged, had been more than usually agonizing.

At the end of a month my patient was quite recovered from her treatment and was again suffering as usual from her periodic visitant. During this time she heard of numerous friends who had been relieved by the remedy—many ladies of her church who carried antipyrin in their purses and during the long prayer, if headache threatened, slipped a capsule or powder or tablet into their mouths and the attacks did not come on. Even after her former experience, though I suspect she never fully realized how the antipyrin had affected her, she consented to try the remedy in one-third the previous dose. I took the precaution to get the medicine from a reliable down-town drug firm and directed that the tablet of five grains of antipyrin be taken on a full stomach and *with* a tablespoonful of whiskey with water.

At the first symptoms of her next headache the patient took her capsule and whiskey as directed and only communicated the fact when she began again to "feel queer."

When the sister of the patient learned that the remedy had been taken, she hastened for me and I arrived at the side of the victim of headaches within a few moments.

She was lying on a sofa with her head raised. her face this time flushed deep crimson, her neck, wrists, and hands covered with urticaria, tearing the clothing from her neck and chest, sighing and gasping for breath with a worried and anxious counten ance —comparable only to the severe dyspnœa of Bright's disease.

The pulse at the wrist was rhythmic, moderately full, but without good tension. The urticaria developed its characteristic wheals rapidly over all the limbs of the patient, the irritation tormenting her and adding to the already existing extreme restlessness. After an hour the severity of the symptoms began to subside.

She has since continued to have periodic headaches. Her general health is good and she wears constantly the glasses fitted during the course of treatment.

To test the quality of the antipyrin used in the first dose, I gave the remaining capsule of fifteen grains to Dr. T. Halstead Myers, who tried it on an appropriate case in his dispensary practice. He reported its action as like that of good antipyrin. The second dose of five grains came from Frazer & Co., New York.

Briefly to recapitulate:

Fifteen grains of antipyrin caused in an hysterical woman—

Sneezing.
Evacuation of the bowels.
Syncope (thirty minutes).
Vomiting.
Prostration.

Five grains caused—

Sneezing.
Urticaria and diffuse hyperæmia of skin.
Dyspnœa.

MEDICAL PROGRESS.

The Use of Glycerine Enemata and Suppositories.—Dr. Alex. S. Polūbinsky, of St Petersburg, publishes in the *Vratch*, Nos. 1, 3, and 4, 1889, an ably written and very instructive paper on the treatment of constipation of various forms by means of glycerine, administered in the shape of either enemata or suppositories. The paper is based on fifty cases from Prof. V. A. Manassein's clinic, of which in forty glycerine enemata and in ten Boas' suppositories were employed. As regards the quantity of glycerine used for an enema, in one case 1 gramme was injected; in nineteen cases, 2 grammes; in thirteen, 3; and in seven, 4. The suppositories contained invariably 2 grammes of the drug, the constituent being either gelatine or cacao butter. Forty-five patients were men, aged from twelve to fifty-five, and five women of from ten to forty. The following brief summary deserves to be placed before our readers.

A. *Results of clinical experiments.*—1. In 23 cases (46 per cent.) the administration of glycerine was followed by abundant motions; in 19 (38 per cent.), by scanty stools; and in 8 (16 per cent.), no action of the bowels took place. 2. The first group includes: *a*, such cases where the presence of fecal masses in the S. Romanum could be ascertained both by palpation and percussion; and *b*, such ones where the fecal accumulation could be elicited only by percussion. In the former subdivision the stools passed were solid and normally shaped; in the other they were rather loose (gruel-like). The first "call" was felt by the patient usually in one or two minutes to increase gradually in its intensity, and to be followed by a motion in three, four, or five minutes. The action was not attended or followed by any unpleasant sensations, except one case, where a rather vivid local burning was experienced by the patient for about fifteen minutes. A controlling enema, made of two and a half or three tumblerfuls of water, and administered after defecation, gave negative results (that is, the water returned unchanged) in 19 cases, while in 4 the fluid was found to be intensely stained with fecal matter. In one of the former 19 cases, however, a subsequent administration of castor-oil (℥j) was followed by a rather abundant stool.

3. The second group includes: *a*, such cases (6) where an ordinary enema, administered subsequently, did not bring about any action of the intestines; palpation detected fecal accumulation only in the sigmoid bowel, the cæcum being empty; *b*, such cases (9) where a glycerine enema produced only scanty stools, but a subsequent ordinary enema was followed by a free discharge; the examination proved that both the sigmoid bowel and cæcum (in other words, the whole large bowel) contained solid or loose fecal masses; *c*, such cases (4) where an after-glycerine aqueous enema remained inactive, but a dose of castor-oil caused abundant motions. The examination gave the same results as in the preceding subdivision, the cases concerning constipation of two or three days' standing. 4. The third group refers to such cases where glycerine gave rise solely to fleeting "calls," but otherwise remained quite inert, stools following a subsequent administration of ordinary enemata or castor-oil. 5. In the shape of suppositories, glycerine acts somewhat more slowly than when injected into the rectum, stools taking place in ten, fifteen, or eighteen minutes, which depends simply upon the circumstance that gelatine or cacao butter require a certain time for their liquefaction. 6. The "calls" induced by glycerine are short-lasting, and when the patient postpones or inhibits his defecation beyond the time indicated above, it may sometimes happen that no stool takes place at all.

B. *Theory of the action of glycerine.*—1. The eccoprotic action of the drug cannot possibly be attributed to anything like its softening or liquefying fecal masses, since (*a*) water, milk, olive-oil, and other fluids, when injected into the rectum in similarly small quantities (6 grammes or so), fail to excite any motions; (*b*) when injected in such trifling doses, glycerine is rapidly absorbed by the mucous membrane; (*c*) stools occurring after glycerine enemata are usually solid and sausage-shaped—

that is, show no signs of liquefaction; (*d*) neither are the masses covered with any watery or slimy layer; (*e*) stools take place within a short time after the administration of glycerine, while the liquefaction process should necessarily require a comparatively long interval. 2. Glycerine undoubtedly causes a local irritation (probably congestion) of the rectal mucous membrane, since (*a*) all patients experience a sensation of warmth or some burning in the rectum; (*b*) there is observed a slight rise of the rectal temperature after the enemata; and (*c*) on a digital exploration during "calls" there are detected fairly strong contractions in the upper portion of the rectum. The drug, however, does not increase the secretion of the rectal mucous membrane. 3. The irritation lasts until there is a complete absorption of glycerine. Possessing a great absorbability, the substance very rapidly penetrates into the (very rich) lymphatic vessels of the rectum, and, having disappeared from the latter, ceases to act. Hence it is unable to establish any considerable peristaltic action of the bowel lying higher up from the sigmoid intestine.

C. *General conclusions.*—1. The best results are obtained from glycerine in cases of fecal accumulation in the rectum and S. Romanum. 2. In cases of fecal stagnation occurring higher up (typhlitis, general intestinal catarrh, etc.) the drug is altogether useless. 3. Glycerine enemata or suppositories are indicated especially (*a*) as a means for "training" the rectum—that is, for exciting regular rectal "calls"—in cases of habitual constipation; (*b*) in cases of constipation caused by fecal accumulation in the large bowel, and depending upon an atonic state of the intestinal muscular coat, as occurring most commonly in women after parturition. Since intestinal atony in such patients is usually accompanied by a similar state of the abdominal press, a systematic employment of glycerine enemata must be obviously supplemented by daily abdominal gymnastics and massage, faradization of the abdominal muscles, and intra-rectal galvanization; (*c*) in such cases where the rectum and sigmoid bowel are mechanically compressed by pelvic tumors (including early pregnancy); (*d*) in retro-version of the uterus associated with pressure on the rectum; (*e*) in children suffering from scrofula of a torpid variety; (*f*) in such persons who experience difficulty and pain on defecation because of their feces being very hard, and who accordingly often abstain from stools. Here glycerine proves useful mainly as a local lubricant. 4. On the whole, glycerine enemata should be preferred to suppositories, since the latter (*a*) are more expensive; (*b*) their use is rather uncleanly (they easily melt in the hands, etc.); (*c*) their introduction into the rectum by a finger represents a by far more unpleasant procedure than an injection by means of a syringe. 5. In one group of cases, however, suppositories are to be preferred to enemata. It is the group mentioned (sub. 3. *f*) where a relatively slow action is desirable, and where the lubricant effects of glycerine are intensified by those of cacao butter.—*London Med. Recorder*, March 20, 1889.

Tracheotomy in Chronic Diseases of the Larynx.—DR. LENNOX BROWNE concludes a paper on the relative merits of early and late tracheotomy in chronic disease of the larynx, with the following *résumé*:

1. Early tracheotomy, with retention of the tube, is advocated in chronic sub-glottic laryngitis and in perichondritis, causing sub-glottic stenosis.

2. Tracheotomy, either early or late, is not advocated in tubercuious laryngitis.

3. It is but rarely necessary in lupus.

4. It is to be performed in œdema, occurring during the course of a syphilitic laryngitis, only after patient treatment has failed; and when performed for such a condition there is a fair chance that the tube may after a time be dispensed with.

Tracheotomy is preferable to attempts at dilatation in the case of syphilitic stenoses, and the tube has generally to be retained for life. Not infrequently the operation fails on account of inability to reach the seat of stricture.

5. The operation may be necessary in benign growths of the larynx, and, when indicated, is better performed early.

6. Early tracheotomy is strongly advocated in malignant disease of the larynx as the safest and surest means of prolonging comfortable life, and in this respect is superior to attempts at radical extirpation.

7. Tracheotomy is necessary in cases of bilateral paralysis of abduction, and should not be delayed if treatment fails to arrest the progress of the disease. It is seldom successful in cases of dyspnœa caused by pressure low down in the trachea.—*Journal of Laryngology and Rhinology*, April, 1889.

To Remove Summer Freckles.—

℞.—White precipitate, Subnitrate of bismuth } āā 4 parts.
Glycerite of starch . . . 15 parts.—M.

Every second day apply a coating of this preparation to the freckles.

Washing the affected parts with the following lotion mornings and evenings will also suffice to remove the freckles.

℞.—Sulpho-carbolate of zinc . . 4 parts.
Glycerine . . . . . 60 "
Alcohol . . . . . 30 "
Orange-flower water . . . 45 "
Rose water . . . . . 250 " —M.

—*L'Union Médicale*, March 23, 1889.

Tuberculosis of the Peritoneum.—From material consisting of twenty-five fatal cases of tubercle in which the peritoneum was either primarily affected, or in which it had been affected for a prolonged period, DR. HEINTZE deduces some interesting facts which he publishes in the form of an inaugural dissertation. All the cases occurred in the Breslau clinic, and necropsies were made in every instance, so that there was no doubt about the diagnosis.

He divides the cases into three groups: 1. Those where there was a copious fluid effusion. Here the clinical symptoms bore considerable resemblance to those met with in cases of ascites from congestion. From this condition they were distinguishable by the very large amount of albumin contained in the fluid drawn off on tapping. No tubercle bacilli, however, seem to have been found. After the distention had been relieved by the removal of the fluid, the thickened peritoneum could frequently be felt, and peritoneal friction could be de-

tected. These effusion cases formed the most numerous of the three groups. 2. The plastic form, producing a coating of tumor-like bodies. The pseudo-tumors formed by the exuded plastic matter could generally be distinguished from real tumors by the ill-defined character of their edges. This group comprised nine of the twenty-five cases, and in five of them there were tumors of considerable size. In these plastic inflammations there is generally a good deal more pain than where there is much fluid effusion; there is a tendency, too, to the formation of kinks in the gut and bands, which cause obstruction, so that fecal accumulations and ileus are not uncommon. 3. The latent form, where there is neither any great amount of effusion nor much plastic exudation. These are the cases which used to be classed as tuberculosis of the peritoneum, in contra-distinction to those in which the inflammatory symptoms were more prominent, which were denominated tubercular peritonitis—a distinction which Dr. Heintze thinks is unsatisfactory.

One remarkable point is mentioned in the dissertation—viz., the frequency with which tubercular disease of the peritoneum is associated with cirrhosis of the liver. This was found in seven of the twenty-five cases. Pleurisy was found twenty times, and signs of scurvy twice. In many cases there were long remissions, so the prognosis is not necessarily quite so grave as it is usually supposed to be. The patients died mostly from general tuberculosis, very rarely from perforating peritonitis or from tubercular peritonitis. Most of the cases occurred in the male sex, frequently amongst men addicted to drink. In three instances an injury to the abdomen had preceded the commencement of the symptoms.

As to operative measures, the only good that can usually be done is to empty the peritoneal cavity, so as to free the vessels from the pressure of the ascitic fluid; paracentesis only accomplishes this imperfectly. In the plastic form, operative measures are, as a rule, useless, it being impossible to remove all the diseased matter, as can be done in tubercular disease of bones or joints; still there are circumstances under which an operation may be imperatively called for—as, for example, where ileus is produced by the formation of constricting bands. Dr. Heintze does not think any advantage is to be expected from opening the abdomen and dusting the viscera with iodoform.—*Lancet*, April 6, 1889.

Antiseptic Midwifery at Liege.—In a paper read before the Liège Medical Society, by Dr. Fraipont, the method adopted at the obstetrical clinic there for rendering labor aseptic is described. The plan is based upon the researches and experience of Döderlein, and is very similar to that employed at the Leipsic clinic, where it is said that since it was commenced the number of absolutely normal puerperal periods has increased as much as eighteen per cent. In Liège every woman is given, on admission, a general bath, and minute precautions are taken to insure cleanliness. During labor the vagina is irrigated each time that an examination is made, by means of a three per cent. solution of creolin, which is injected through a glass tube introduced together with the index finger, which is made to reach as far back as the cervix. The labia are then occluded, so that the fluid may distend the vagina and obliterate all the rugæ, and reach even into the interior of the os, detaching and washing away the mucus accumulated there. From one to two quarts of the solution is used for each irrigation. Immediately after the placenta is detached, another irrigation is administered, which is repeated regularly during the first few days of the puerperal period. It is necessary to say that no lard is ever used, a substitute being found in a saponaceous preparation which is known under the name of "molline," and which, while acting as a detergent, is freely soluble in water.

Dr. Fraipont is much pleased with creolin for obstetrical purposes, considering it superior to the more generally used antiseptics. One advantage he mentions, which does not seem to have attracted attention generally, is, that it makes the mucous membrane soft and supple, giving it the feeling of having been oiled. When used in gynecological operations, where it is necessary to obtain a good view of the parts, it has, it is true, the disadvantage of obscuring the lesion with a milky fluid. This inconvenience is, of course, not felt in midwifery. In Dr. Fraipont's opinion, creolin ought to be given to midwives instead of such a powerful and dangerous antiseptic as corrosive sublimate, which, it is to be feared, they sometimes use with more zeal than discretion.—*Lancet*, April 6, 1889.

Absolute Rest in the Treatment of Tetanus.—Dr. E. de Renzi (*Rivista Clinica e Terapeutica*, January, 1889) states that since the year 1882, when he first tried this method, he has treated six cases of tetanus, five of which recovered. The following are the author's rules for this treatment:

1. The patient, whose ears are closed with cotton or wax, must remain in a perfectly dark and noiseless room, and should be told that recovery depends upon his keeping perfectly quiet.

2. Carpets should be laid in the sick-chamber and adjoining halls and rooms, in order to deaden all footsteps.

3. The patient's room should only be opened every four hours, and then with the greatest care. All food should be in the liquid form, such as milk, eggs (beaten), soups, wine and water, etc., and should be brought to the bedside in a cup.

4. One should enter the sick room with a covered light, being rather guided by the patient's moans than by one's sight.

5. If the patient be constipated, neither laxatives nor enema should be administered; nothing whatsoever is to disturb the patient's rest.

6. If the pains are intense, ergot and powdered belladonna may be resorted to.—*Bulletin gén. de Thérapeutique*, March 30, 1889.

Treatment of Eczema.—The *Revue gén. de Clin. et de Thérap.* of March 28th gives the following formulas for this affection:

Dr. Unna recommends for pustular eczema:

℞.—Oxide of zinc, Gelatin } āā 15 parts.
Glycerine . . . . 25 "
Water . . . . . 45 " —M.

Heat slightly, and apply with a camel's-hair brush.

Dr. Veiel, of Canstatt, recommends the following for pruritus:

℞.—Powdered starch . . . 98 parts.
Powdered camphor . . 2 " —M.

In the squamous stage of certain chronic eczemas the following is recommended:

℞.—Tar . . . . . 1 part.
Alcohol . . . . . 3 parts.—M.

Large Vesicular Calculus in a Child.—M. DURET, in the *Journal des Sciences méd. de Lille*, records the following remarkable case of vesical calculus in a male child of six years. The symptoms of stone had existed for two or three years. When the sound was introduced by the author into the urethra it impinged almost at once upon an enormous stone. There was, practically speaking, no vesical cavity, the mucous wall was in contact throughout with the calculus, and the urine escaped drop by drop continuously. Examination by the rectum revealed a large and hard tumor behind the pubes, which was formed by the bladder containing the stone. The urine was albuminous. The bladder was opened by the suprapubic method, but after this had been done it was found impossible to extract the calculus, owing to the firm way which the bladder had contracted upon the concretion. The finger of an assistant having been passed into the rectum, the bladder was raised *en masse*, and thrust forward; the stone was then broken up with a chisel and mallet, and the fragments removed. A drainage tube was fixed in the wound, no suture being placed in the bladder wall. The calculus weighed sixty grammes, and was composed of an oxalate of lime nucleus and phosphates. —*Medical Press*, April 3, 1889.

The Microbes of the Stomach.—DR. ABELOUS, at a meeting of the Academy of Sciences, stated that he had isolated from the products of washings from his own stomach, while fasting, sixteen species of microbes, of which he has studied the morphological characters, as well as their action upon alimentary substances (food-stuffs).

Of these sixteen species, seven are known: the sarcina ventriculi; the bacillus pyocyaneus; the bacterium lactis aërogenes; the bacillus subtilis; the bacillus mycoïdes; the bacillus amylobacter, and the vibrio rugula; of the nine remaining undescribed, one was a coccus, and eight were bacilli.

All of these microbes resist the action of artificial hydrochloric acid (1.7 parts of HCl to 100 parts of water) for a lapse of time much longer than the duration of stomachal digestion; especially is this the case when the cultures are rich in spores.

The following are the general results of the action of these microbes on alimentary substances (each species having an action more or less energetic): Ten attack albumin; twelve fibrin; nine gluten; ten transform, more or less completely, lactose into lactic acid; eight have a converting action on cane-sugar; eleven help, more or less, toward the formation of alcohol from glucose; thirteen assist the formation of glucose from starch.

The most remarkable results, however, are obtained from the combined action of all these microbes, at the same time, upon each alimentary substance. Under these conditions (especially when some chalk is added) one will observe a very rapid and very energetic decomposition with liberation of gas and the formation of such products as leucin, tyrosin, indol, skatol, and certain fatty acids and ammoniacal compounds. Considerable quantities of alimentary substances can be thus decomposed in a very short time.—*Revue de Thérap.*, April 1, 1889.

Carbolic Acid and Iodine in Whooping-cough.—DR. ROTHE, having met with some unfortunate cases of whooping-cough treated with antipyrin, turned his attention to a combination of iodine with carbolic acid in the treatment of this affection, and with this combination he has obtained excellent results. He has, he says, treated hundreds of cases, and cannot remember one in which the affection lasted longer than four weeks, besides which no fatal case occurred. The mixture he employs is as follows: acid. carbol., 15 gr.; sp. vin., 15 gr.; tinct. iod., 10 gtt.; tinct. bellad., 30 gr.; aq. menth. pip., 2 oz.; syr. opiat., 150 gr. A teaspoonful of this is given to children over two years of age every two hours. When this treatment was carried out from the commencement of the complaint the severity was never great, and even when it was only begun in cases that had been going on for six or seven weeks it soon cut them short.—*Lancet*, April 6, 1889.

Local Antiseptic Treatment of Erysipelas.—DR. NUSSBAUM (*Gazette Hebdomadaire*, March 29, 1889) replaces antiseptic subcutaneous injections for erysipelas by the following treatment:

1. Anoint the erysipelatous surface with the following ointment:

℞.—Ichthyol } . . . āā 15 parts.
Lanoline }

2. Immediately after having applied the above, envelop the affected portion with salicylated cotton.

This mode of treatment arrests the progress of erysipelas and diminishes the pain and the cutaneous inflammation in the space of from a few hours to three days.

Stimulating Liniment.—

℞.—Phosphorized oil . . 50 parts.
Chloroform } āā 10 parts.—M.
Tincture of nux vomica }

Rub the paralyzed members three times daily for five minutes with a flannel saturated with this mixture. After which envelop them in salicylated cotton.—*L'Union Médicale*, March 24, 1889.

Injections of Pilocarpine for Traumatic Tetanus.—DR. LUIGI CASATI reports having used pilocarpine injections with success in three cases. The results obtained from the author's experiments upon animals are, according to the *Deutsch. med. Ztg.*, as follows: Of 9 tetanized rabbits treated with pilocarpine 7 recovered and 2 died, whereas of those not so treated, all died as soon as the first symptoms of tetanus manifested themselves. Recovery is generally rapid, but after the symptoms of tetanus have disappeared they always recur a second time, and end either in complete recovery or death. Several hours after the injection a distinct division of the symptoms takes place. Trismus is the last symptom to disappear. The tetanized animals support doses of pilocarpine which, under normal circumstances, would prove fatal. Pilocarpine does not interfere with the development of the tetanus bacillus; should one inject Brieger's ptomaine in conjunction with pilocarpine, the rabbits will show no symptoms of ptomaine poisoning. but only the curative action of pilocarpine.—*Wiener med. Presse*, March 17, 1889.

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THE EFFICIENCY OF WATER FILTERS.

IT is well known that drinking-water may be the carrier of the germs of disease, and also be rendered otherwise unwholesome by the admixture of foreign substances both organic and inorganic. It is also a fact that drinking-water supplied to cities is often below the proper standard of purity, and in some instances positively bad. The failure of city corporations to supply water of good, wholesome quality, or at least of the appearance of such, has made it necessary for individuals to resort to means of supplying the deficiency. The expedients adopted for this purpose are mainly boiling and the various methods of filtration.

Domestic filtration is commonly employed to strain out suspended matter, and thus clarify the water. A more important object is the removal of bacteria. The efficiency of the various kinds of filters in the market in removing suspended particles is easily tested, but the determination of the efficacy of different filtering materials in removing microōrganisms requires skilful manipulation in the biological laboratory. Chemistry failed to furnish the desired proof, and no means was available until the culture process was introduced. The application of this test has led to important discoveries, which have exposed the imperfections of filters usually selected for household use, and stimulated the search for materials better adapted to meet the newly imposed and most essential requirements of the process of filtration.

In an elaborate paper on the efficacy of filters, and other means employed to purify drinking-water, read before the Section of Public Health of the New York Academy of Medicine, on April 5th, and presented in the last and present issues of THE NEWS, DR. CURRIER has given the results of carefully conducted experiments, which show how little dependence can be placed on the usual methods of domestic filtration in removing infective matter from water. He shows that domestic filtration, as commonly practised, is little else than a process of straining, which clarifies the water but fails to remove bacteria. In fact, old filters, constructed of improper materials, and even sterilized filters of the best forms, after a comparatively short time, furnish water with a larger percentage of bacteria than that contained in the water before filtration. This result is due to the filtering materials, as charcoal, sand, and even porous stone and porcelain, becoming charged with microbes, and forming a suitable nidus for the development of these minute forms of life.

There is a limit to the purifying powers of even the best constructed filters. Their action, at best, is but temporary. The materials should, therefore, be frequently renewed, and porcelain and stone should be sterilized by heat, if the function of purification is to be maintained.

Dr. Currier's conclusions, based upon very elaborate experiments, are, briefly: That boiling for thirty minutes will destroy harmful bacteria; that chemical agents are useless for sterilizing drinking-water; that ordinary filters do not remove all bacteria from drinking-water; that filters of porous rebaked porcelain are the best, but to insure permanency of action they should be occasionally sterilized throughout by steaming, or other means. When filtration is necessary, it should be conducted carefully on a large scale through sand-beds upon which there is a fine layer of organic and inorganic matter expressly produced by sedimentation. When domestic filtration is employed, on account of danger of infection, the water should, as a rule, be furthermore boiled.

TREATMENT OF ACUTE INTESTINAL OBSTRUCTION.

The treatment of abdominal surgical affections has of late enormously outdistanced their diagnosis. Likewise it is true that all cases which finally come to the knife would present infinitely more recoveries could their exact existing condition and subsequent

course be recognized from the onset. So also exploratory incision of the peritoneum in the hands of competent men has come to be intrinsically so safe a procedure that, considering the ulterior consequences of an expectant course, early resort to it is justified and indicated in many suspicious cases. We believe that were the remote terminations of one hundred cases of obscure abdominal disease treated upon the expectant plan compared with those of another hundred indiscriminately explored during the earlier stages, the results would preponderate in favor of the latter method to a startling degree. This, we believe, would be the conclusion were all classes of abdominal disease included. Limiting the series to acute cases, the favorable percentages would be again greatly increased; but, excluding therefrom all save those presenting symptoms of acute intestinal obstruction, we should expect that the terminations would overwhelmingly indicate surgical interference in every case at the earliest onset of suspicious or presumptive symptoms.

These remarks have been elicited by a recent communication to the *Archiv für Chirurgie*, 1889, Band 38, Heft 2, from PROF. VON WAHL, in which he narrates the histories of three cases of volvulus, and lays particular stress upon the likelihood and dangers of septic complications of the later stages of intestinal obstructions, and their avoidance by earlier surgical interference. His first case, a female, aged nineteen, was operated upon four and a half days after the onset of symptoms of obstruction originating shortly after a severe lifting strain. Sanguinolent serum in quantity was present in the abdominal cavity, and a coil of small intestine was twisted and bound beneath a mesenteric band in the left hypochondrium. Upon puncturing, emptying, and untwisting the intestine, the band disappeared, and the gut quickly resumed its normal appearance. The knife punctures were closed by suture, and the peritoneum irrigated. Convalescence was retarded and endangered by severe septic pneumonia, but recovery finally ensued. Case two occurred in a female pregnant six months. Abortion took place five days after the onset of obstruction symptoms, and operation was performed on the sixth day. Shortly before the beginning of pregnancy a tumor had been removed from the left side of her pelvis. Upon section, one portion of small intestine was found fixed by adhesions in several places, and around this fixed portion another loop of bowel had rotated through an arc of 180 degrees. The adhesions were separated by the knife, and the gut was then, without difficulty, unfurled. Convalescence in this case likewise was complicated by septic pneumonia, but the patient was ultimately cured. The third case was one of rare occurrence and interest. An adult male, after a severe lifting strain, soon experienced the usual symptoms of intestinal obstruction. Upon admission to the hospital three days afterward, a tumor six inches in breadth could be felt extending from right to left in a downward direction across the umbilicus. Section revealed a 180 degree rotation of the *whole small intestine* upon its mesenteric attachment, which latter made a firm constricting band. Intense congestion of the intestines and much sanguinolent serum were present. Death followed from general septic intoxication.

Von Wahl also quotes from the literature of intestinal obstruction cases where death succeeding operation was plainly caused by metastatic parotitis and pneumonia, by acute septic œdema of the glottis and lungs, and by pneumonia of the same nature as was encountered in his own cases. Septic poisoning and metastasis must, therefore, be held responsible for much of the shock, exhaustion, and subsequent complications which so often accompany cases of acute obstruction, especially by volvuli, which from their very nature should be most curable if the proper remedy is not too long withheld. For almost all varieties of the latter affection can most easily and safely be relieved by early operation; simply to untwist them is all that is usually required, but occasionally one or more adhesions must be parted or the bowel punctured before untwisting can be accomplished; thus dealt with in the early stages, the mortality should not exceed ten per cent. Hence, diagnosis of abdominal obstruction affections not having attained to the same high point of perfection as has their treatment, exploratory section should be our almost indiscriminate resource until diagnosis shall have become more exact and reliable.

WE chronicle with much pleasure the rare sense of justice shown by a municipality in its appreciation of the professional services of a physician. The municipal assembly of the city of St. Louis has just appropriated the sum of $500 to Dr. A. C. Bernays for medical attendance upon a member of the police force, from June to September, 1888, who, while in the discharge of police duty, received a gunshot wound of the abdomen, and upon whom Dr. Bernays successfully performed laparotomy.

At recent commencements the degree of Doctor of Medicine was conferred as follows:

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Memphis Hospital Medical College	62
University of Georgia, Augusta	53
College of Physicians and Surgeons, Chicago	48
Chicago Medical College	46
University of Buffalo	46
Detroit College of Medicine	43
College of Physicians and Surgeons of Keokuk	39
Indiana Medical College, Indianapolis	27
Woman's Hospital Medical College, Chicago	25
Arkansas State Medical College, Little Rock	22
Iowa College of Physicians	9
Georgetown (D. C.) University	8
Toledo (O.) Medical College	8

We regret to learn that a singular and painful accident has just happened to Dr. W. T. Ennett, one of the Vice-Presidents of the North Carolina State Medical Society, on the 17th instant. He was visiting at Garysburg, and was sitting before a fire-place, when suddenly a pulmonary hemorrhage came on. He became unconscious therefrom, and slipping forward his feet came in contact with the fire. Before help could reach him he was very seriously burned.

By the will of the late William J. Syms, of New York City, the Roosevelt Hospital will receive $350,000. Of that amount $250,000 is to be used in the erection of a surgical operating theatre, at the easterly end of the lot on which the hospital stands. The theatre is to be under the direction of Dr. Charles McBurney, and to be called the "William J. Syms Operating Theatre of Roosevelt Hospital." The remaining $100,000 is to be invested and the income applied to the expenses of the operating theatre.

The Medical College of the State of South Carolina proposes to elect a Professor of General Pathology and Practice of Medicine about the middle of next month.

In New York City, two physicians were invited to apply a so-called "hypnotic" test to an accused boy-murderer. Some persons having advanced the theory that the boy might have committed the crime while under the influence of another person's will-power, these two physicians were applied to, as experts in hypnotism, to experiment with the accused and to ascertain if he was a "subject." The results of the trials were negative, and one of the experts is reported to have said that the presumption was very strong that the boy had never been hypnotized. But what would have been the gain if the reverse had been the result?

SOCIETY PROCEEDINGS.

NEW YORK ACADEMY OF MEDICINE.

Stated Meeting, April 18, 1889.

The President, Alfred L. Loomis, M.D., in the Chair.

Dr. E. F. Brush read a paper on

THE RELATIONSHIP EXISTING BETWEEN HUMAN AND BOVINE TUBERCULOSIS.

Tuberculosis was not, he said, as many suppose, the result of civilization, since barbarous and uncivilized races were afflicted by it as severely as many of the most advanced civilized races. Neither geographical position nor climatic conditions were a factor in its distribution, although every known part of the globe, with the exception of a few isolated areas, was a habitat of the disease. After several years of close study of the affection, including a consideration of all accessible statistics and the habits of the people where it prevails, he had arrived at the conclusion that the only constantly associated factor is found in the in-bred bovine species. If a community was closely associated with in-bred dairy cattle tuberculosis prevailed there. In Hirsch's work on *Geographical Distribution of Phthisis*, it was stated that in Cape Colony this disease is oftenest met with among the Hottentots inhabiting the plains near the coast. These people are great milk-drinkers; they suck the blood from the jugular vein of the living bullock, and they churn together blood and milk for a drink; Professor Law, in his *History of the Ox*, informs us that in the vast regions of Southern Africa cattle abound and multiply, and proof that these African cattle are in-bred is found in the writings of Darwin and others. These facts relating to the cattle-breeding propensities of the negroes account for the statement of Daniel that phthisis is widely prevalent and very malignant among the people of the West Coast of Africa. In the interior plateaux of Southern Africa, on the other hand, the disease hardly ever occurs; and this immunity could be accounted for by the presence of the tsetse fly, since, where this insect exists, cattle, horses, and dogs cannot live.

Coming to the civilized world, Dr. Brush first drew a comparison between Denmark and Iceland, where the climatic conditions are nearly the same. In Denmark, where there is one cow to every $1\frac{5}{7}$ of the human population, phthisis was found to be very common, and with a high rate of mortality; while in Iceland, where there is only one cow to four individuals, the disease was extremely rare. And it is a fact that the only people on the face of the globe who enjoy an absolute immunity from phthisis are those who are not in possession of the domestic cow. Thus, among the Kirghises on the steppes of Russia, who consume large quantities of mare's milk, and eat the flesh of horses and sheep, but have no cows,

a case of phthisis, according to Dr. Naftel and other authorities, was never known. The Esquimaux also enjoyed the same immunity because they had domesticated the reindeer and not the cow.

In considering the statistics of Europe it would be found that the prevalence of phthisis is regulated by the ratio of the bovine to the human race; and he thought there could be little doubt that the in-bred species of the bovine race is the prime etiological factor of tuberculosis in the human race. They not only fostered the germ, and prevented its extinction, but sowed it in the human race continually and abundantly. Without their aid the germ would perish, for of all germs known, none had so hard a struggle for existence in man as the bacillus of tubercle; as was shown by the fact that of the immense number of individuals who are exposed to the infection, so comparatively few contract it.

The cow was the only known animal that had transmitted tuberculosis to her offspring in inheritance. After diligent search he had failed to find a single well-authenticated case on record of a human fœtus at term showing evidence of tuberculosis; but in 1885 Johne had placed on record an undoubted case of congenital tuberculosis in a fœtal calf of eight months.

In conclusion, Dr. Brush said man cannot generate new forms, but he can so control and interfere with Nature's processes as to modify the original design. In-bred cattle are selected, sheltered, and pampered, so that they would be unable to withstand the rigorous conditions of the wild state. They propagate earlier, are larger milkers, and are more efficient beef-producers, while their meat is more delicate and tender than that of the wild animal. All this is achieved by man at the expense of his own health.

DR. H. M. BIGGS very strongly dissented from these conclusions. He believed that the statistics given were not strictly true; but even if they were true, he did not think they would prove the correctness of the position taken by Dr. Brush, since they left out of consideration all the other factors concerned in the production of tuberculosis. He had left entirely out of account the influence of age, altitude, and occupation, which had been shown to be very important etiological factors. There was the strongest evidence that tuberculosis could be transmitted by milk; yet notwithstanding this it was certainly true that the disease was not often conveyed in this way. If this was the case, the disease ought to be much more common among young children, who live almost entirely upon milk, than among any other class of individuals; while, as a matter of fact, it was extremely rare among this class. The facts appeared to show that phthisis is most common among the most highly civilized nations, and among the native populations of uncivilized countries who are brought into more or less constant contact with foreigners from civilized countries.

In all civilized countries there were to be met with other elements (particularly that of occupation), which enter into the causation of the disease. Confinement in close, ill-ventilated apartments had a most pronounced effect upon males and females alike. More than this, Dr. Brush's theory was entirely inadequate to account for the marked prevalence of the disease among armies and the inmates of prisons.

Again, other things being equal, phthisis was found to prevail in proportion to the density of the population. According to the Brompton Hospital reports, 70 per cent. of the patients suffering from phthisis had been accustomed to spending their time in hot and dusty rooms. As regards the distribution of the disease among different classes, in every 1000 deaths, 168 of the patients were grocers, 108 tailors, and 301 drapers; while nearly 500 printers died of phthisis. He could not but regard the conclusions of the paper as unfortunate, especially if they should be accepted, since they would have the effect of diverting attention from the most important mode of origin of phthisis, viz., transmission from the human subject.

If the disease were derived from animals it could only be through the avenue of the alimentary canal, and it was a well-established fact that the number of cases in which the infection enters the system through the alimentary canal are exceedingly few. In the case of animals fed on tuberculous matter the resulting tuberculous disease, when such occurred, was found to be located in the alimentary canal, not in the lungs; and there was every reason to believe that the same would be true in the case of the human subject. It seemed to him ill-advised to look for the cause of the trouble in this unlikely source, when there were so many ready ways by which the human system might become infected with tuberculosis. One of the most prominent of these was undoubtedly the sputa of tuberculous patients. The sputa of all such individuals abounded in tubercle bacilli, and when it was remembered how large was the quantity of the expectoration of consumptives and for how long a time the disease often lasted, it could well be appreciated what a source of danger to others this constituted. The sputum was apt to be scattered all around, and on its becoming dry, the bacilli it contained often floated about with the dust in the air. The bacillus was the universally recognized special cause of tuberculosis, and it might thus be seen how readily it could be inhaled in this way, and so brought into direct contact with the lungs, which were the ordinary seat of the disease. We had no proof that the meat of tuberculous animals taken into the stomach was capable of producing tuberculosis of the lungs; and, moreover, it was a fact that the viscera and not the muscles of tuberculous animals were affected with tubercle. In tuberculous animals, furthermore, the milk was not infected with the bacillus unless the mammary glands were implicated in the tuberculous disease.

The sputum of tuberculous patients was, therefore, the chief agent by means of which the disease was spread; and, although he felt convinced that a much larger number of cases really originated from animals than was generally supposed, yet this class constituted but a small number of all the cases of phthisis.

DR. FORREST said that in the Southern States there were certain sections where phthisis was almost wholly unknown among the whites, but was very common among the blacks. Yet it was well known that far more fresh beef and milk was consumed by the white population than by the negroes, who lived principally on corn and pork. It was also a fact that a very fine stock of cattle was now raised in these same districts. He could not see how, therefore, that the condition of affairs which he had described could be reconciled with the theory of Dr. Brush.

THE PRESIDENT said it seemed to him that the posi-

tion taken by Dr. Brush was too narrow a one, and that any one who assumed that phthisis is due to one cause alone was begging the question. It was a disease that had many causes, and the bacillus which constituted its special etiological agent would not give rise to it unless it met with conditions which favored its development. Among the conditions to be taken into consideration were climate, hygienic surroundings, heredity, and soil, and a long list of causes must be in operation before the bacillus was able to do its specific work. This, he believed, was a point which should not be lost sight of.

DR. BRUSH said that he thought that his position had been misunderstood. He did not wish to imply that the disease was derived alone from the cow. All that he claimed was, that wherever in-bred cattle existed, there was found phthisis also. He needed no proof to show that but a small proportion of individuals who were exposed to the infection contracted the disease, since, although the number of deaths from phthisis in every civilized community was appalling, it would be infinitely greater than it is if this were the case. He had frequently known of children drinking the milk taken from cows dying of tuberculosis, and yet there could be no question that the large proportion of them escaped infection. In addition to the bacillus, there must be present the conditions favorable to its development. But, at the same time, he believed that the disease was originally derived from the bovine species. He did not believe that less than fifty per cent. of all dairy cattle were affected with the disease, and the statistics which he had quoted showed that wherever there was a race of people without cattle phthisis was unknown. He believed, furthermore, that if all the cattle in this country were to be killed, the disease would finally die out entirely here.

He did not wish to rely on statistics except so far as they substantiated the main point that he made, that wherever cattle existed, there phthisis also existed.

The practical outcome of the whole matter, to which he wished to call special attention, was, that the prevalence of phthisis could undoubtedly be diminished by properly regulating the breeding of cattle by law, so that the in-breeding now so common might be done away with.

SECTION ON PÆDIATRICS.

J. LEWIS SMITH, M.D., CHAIRMAN.

Stated Meeting, March 14, 1889.

DR. H. W. VINEBERG presented a case of

LARYNGISMUS STRIDULUS AND ECLAMPSIA ASSOCIATED WITH RACHITIS

in a male child, nine months old, of good family, and who had never suffered injury except once when it fell out of bed. Some time after this accident the child was attacked with laryngismus stridulus with severe convulsions, three or four attacks coming on each day. On examination the patient was found to be fat, flabby, anæmic without craniotabes or bone deformity. The temperature was normal; the urine was not examined. No improvement followed the administration of calomel, cod-liver oil, or ol. phosphoratum. After ten grains of potassium bromide were given twice daily the attacks ceased. At the present time the child is taking wine of iron.

Previous to 1843 laryngismus stridulus was supposed to have some connection with the thymus gland. Friedleben and others have pointed out its frequent association with rachitis. Reflex irritation from almost any part of the body may bring on an attack. The morbid anatomy of the subject has as yet not been cleared up. Attacks of asthma and stridulous croup are sometimes mistaken for true laryngismus. The prognosis is grave. The treatment should be directed to the attack and the interval between attacks. Warm baths, cold douches, tickling the fauces, the bromides, musk, apomorphia, and belladonna are recommended; also phosphorus and cod oil.

DR. JACOBI remarked that the arytenoid (adductor) muscles are supplied by the recurrent laryngeal nerve; reflex irritation may be central or peripheral, as from the stomach, bronchial glands, mediastinal tumors, or enlarged thymus; the latter may cause sudden death by local pressure in children with a small sterno-vertebral diameter. Cranial rachitis is the usual central cause and prolonged apnœa may occasion sudden death.

DR. VINEBERG also presented as a case of

TETANY,

a child fifteen months old, having but four teeth and suffering from diarrhœa; the feet, hands, and fingers were flexed through contracture of the muscles.

DR. J. LEWIS SMITH remarked that the case was probably one of idiopathic contracture as described by Henoch in his treatise on children's diseases. He remembered having seen three such cases.

DR. C. H. MAY read a paper on

SCARLATINOUS OTITIS.

According to different authors, four to five per cent. of all aural affections are due to scarlatina. Burchard Marion reports that of 5613 deaf-mutes ten per cent. became so affected in consequence of scarlatina. The diagnosis in young children is difficult to make. As a rule, the little ones press the affected side into the pillow. Chills, convulsions, pain, restlessness, a stupid gaze are the usual symptoms; the glands are swollen. The purulent and diphtheritic variety present severe symptoms and a tendency to tissue necrosis. The prognosis is influenced by treatment and is usually good.

Treatment: An ice bag to the temporo-maxillary region, or hot fomentation, or tincture of iodine, or leeches are applied behind the ear. Injections of hot salt water and cocaine, ʒj ad. Oj, into the ear will control pain. In noticeable congestion and bulging of the membrana tympani paracentesis should be performed. To facilitate the discharge of pus the ear may be inflated by means of a catheter or Politzer's bag. A catheter should not be employed in children under four years of age. Dr. May thinks there can be no danger of forcing infectious matter into the middle ear. He does not advise packing the auditory canal with dry boric acid powder. Paracentesis should be made in the postero-inferior quadrant of the drum-head; and Wilde's incision over the mastoid process is often necessary. Pilocarpine has been recommended when the nervous

apparatus is involved, but no noteworthy results have been reported.

DR. SEXTON remarked that the inflammatory process shows two distinct varieties, it being confined either to the atrium of the ear or localized in the attic. When of the latter variety the pus may burrow upward and cause a fatal termination. In incising the membrane illumination should be obtained by electric light. Children should be etherized. Bloodletting, poulticing, douching should not be practised, as they give no relief. He preferred mild treatment and frequently administered aconite and gelseminum. Otitis media might arise from sympathetic irritation from the teeth.

DR. GRUENING remarked that in his opinion iodine applied externally could be of little value. He would not apply leeches in children who are weak from high fever of an infectious disease, on account of the danger of abstraction of blood; furthermore, he advises early incision, especially if the membrane is densely red. The ear can be illuminated by means of an ordinary light. A distinction between pus in the atrium or attic is superfluous. To remove pus from the ear he aspirates, because the use of the catheter or Politzer's bag is liable to force infectious material into the ear. In conclusion he stated that dentition has nothing to do with otitis.

DR. POMEROY spoke of the value of diminishing hyperæmia of the parts by means of leeches and aural douches of salt water in order to prevent the attack from becoming formidable. He also employs the hot water bag and opium. After puncture he uses the Politzer bag and no catheter in children. Packing the auditory canal is fruitless in acute cases but should be employed in chronic cases. Should a swelling present itself behind the ear he should cut down upon its apex into the soft bone.

DR. POOLEY objected to the term scarlatinous otitis, a special name being unnecessary. In the treatment the element of rest was very important. Local abstraction of blood he thought advisable. Hot water should be applied by means of a medicine dropper, and the ear kept clean by syringing. He believed the use of the catheter or bag to be injurious in acute cases.

DR. MAY closed the discussion by stating that Politzer's inflation was certainly indicated in retention of pus.

SECTION ON THEORY AND PRACTICE OF MEDICINE.

R. C. M. PAGE, M.D., IN THE CHAIR.

Stated Meeting, April 16, 1889.

DR. M. ALLEN STARR read a report on

SIMULO IN THE TREATMENT OF EPILEPSY.

In March, 1888, Dr. W. H. White, of London, published in the *Lancet* some observations on the use of simulo in the treatment of epilepsy. The drug was employed in the form of a tincture made from the kernel of the pit of the fruit of the simulo plant (capparis corriacea), which was given in one to two drachm doses three times a day. Having given a brief description of the simulo fruit, Dr. Starr stated that the tincture is of a yellowish-brown color and has an aromatic taste, reminding one slightly of sherry.

Dr. White reported seven cases of epilepsy treated by his agent, all of them being cases in which several fits occurred every week. In the first case neither simulo nor bromide was of any particular benefit. In the other cases there was considerable improvement under the use of simulo, and in case number seven, which was one of unilateral spasms with paresis, the spasm was very much relieved by the drug, although it had not been affected by larger doses of the bromides. He concluded his report by stating that he would not have it thought that simulo will cure epilepsy, but he believed that an improvement occurs under its use, and that it may be used as a substitute for the bromides when these produce ill effects.

In August, 1888, Eulenberg, of Berlin, published a report of seven cases treated by simulo, four of them being epileptic, and three hysterical in character. It appeared to have no effect whatever in the cases of hysteria, and in three of the cases of epilepsy its effect was found to be weaker and less certain than moderate doses of the bromides (90 to 120 grains daily). In the fourth case, in which the use of the bromides for years had not succeeding in reducing the number of attacks below four to eight in a week, the effect of maximum doses of simulo (six drachms daily), was to reduce the number of attacks to two to five in a week. Subsequently Eulenberg combined the bromides with simulo, giving a half dose of each, and the effect was at first as favorable as under the use of large doses of simulo alone. The frequency of the attacks gradually increased, however, and finally the patient was put back upon the bromides alone. Eulenburg's conclusion was that while simulo is not without use, it is decidedly inferior to the bromides in its effects.

Dr. Starr procured some tincture of simulo from the manufacturers, Christy & Co., of London, and in October last commenced its trial on a number of epileptic cases of extreme severity, which seemed to offer the conditions for a fair test of the powers of the drug.

Case 1 was a female, forty-eight years of age, who had had hysteria and epilepsy since the age of sixteen. The effect of the bromides was to reduce the attacks of petit mal, from which she suffered, from four to six daily to one or two daily, and also to reduce decidedly the frequency and severity of her attacks of grand mal, which without treatment occurred about once in two months. The use of bromide was attended with such bad effects, however, that it was found impossible to keep it up continuously, and as no other agent (with the exception of nitro-glycerine, which always had a favorable effect upon the petit mal attacks, but none on the grand mal attacks) had been found of service, the case was a very difficult one to manage. This patient was kept for two months on tincture of simulo; but, while for a time it prevented the occurrence of an attack of grand mal, it failed to arrest hysterical attacks or attacks of petit mal, and as the petit mal attacks increased under its use, it was then thought best to suspend the treatment.

Case 2 was a girl, twelve years old, who had had epilepsy ever since infancy, her attacks consisting of slight convulsions with loss of consciousness and loss of urine. The bromides had been used without any marked effect. Under the use of tincture of simulo, the dose of which was gradually increased from half a drachm to two drachms three times a day, the number of attacks became reduced from about five a week to

about three a week, while their severity diminished, and she no longer lost control of the bladder.

Case 3 was a girl of sixteen, who had suffered from epilepsy with both grand mal and petit mal attacks for two years. The simulo, in doses of two drachms three times a day, had no effect upon the petit mal attacks, but diminished the grand mal attacks from sixty-three attacks in a month (December, 1888, before the drug was commenced) to four attacks in a month (in February, 1889, the simulo having been commenced January 8th). During the month of February she had seventy-five attacks of petit mal. During the month of March, however (the simulo having been stopped February 26th), on bromide, chloral, and belladonna with nitroglycerine, she had no grand mal attacks and but eighteen petit mal attacks.

Case 4 was a girl of fifteen, who had attacks of grand mal since the age of twelve. The attacks occurred about every three weeks, in spite of bromide treatment. On February 9, 1889, she was placed on tincture of simulo, one drachm three times a day. On February 16th she had an attack, and on February 23d the dose was increased to two drachms. Up to April 16th no attacks had occurred; this being an interval of eight weeks, instead of the usual interval of three weeks.

Case 5.—John H., aged eighteen, had convulsions as a baby, but was free from them until the age of fifteen, when he had an attack of grand mal. Such attacks had recurred at shorter and shorter intervals, and when he applied for treatment, January 31, 1889, he had had one attack every month for several months. He was put upon tincture of simulo (six drachms daily), and reported on March 30th that he had no attacks since the treatment begun.

Case 6.—Max L., aged twelve, has had epilepsy ever since the age of two years; attacks of grand mal about once a month and attacks of petit mal several times a day. He was put upon tincture of simulo (six drachms daily) December 26th, and took it continuously until March 11th. During this time he had no attacks of grand mal, but the attacks of petit mal continued as before.

Case 7 was a young man of nineteen, who had had procursive epilepsy since the age of seven, the attacks consisting of a sudden pallor, followed by a flushing of the face and a sudden uncontrollable movement of the body. These attacks had never been controlled by bromides, and during the year 1888 they averaged one hundred every month. Tincture of simulo also had no effect upon them; but under the use of nitroglycerine combined with bromides they were reduced one-half. In addition, this patient had nocturnal convulsions, and the simulo was found to have a decided effect upon these attacks of grand mal, although the results obtained from it were inferior to those from the bromides. The case manifested many signs of abnormal cerebral development and showed tendencies toward paranoia.

The conclusions drawn from these cases by Dr. Starr were as follows:

1. Tincture of simulo has no effect upon attacks of hystero epilepsy or upon the hysterical state.

2. It has no effect in modifying the frequency or severity of attacks of petit mal or of procursive epilepsy.

3. It has some effect in modifying the frequency and severity of attacks of grand mal, but is inferior in this respect to the bromides.

4. In cases where for any reason it is deemed necessary to suspend the bromides, it would be well to substitute simulo for them.

There seemed to be no ill effects from the use of the drug. He found no evidence of change in the rate or character of the pulse or respiration or other physiological effects produced by the doses employed, and he thought it would be well to increase the dose progressively until one or even two ounces are used daily. The chief objection to its use at present is its costliness, the price being 25 cents an ounce. The suggestion of Eulenberg that it would be well to obtain and use the active principle of the drug, he thought worthy of consideration.

Dr. E. D. FISHER said that he had had no practical experience with the use of the drug, as its costliness was such that he had not felt justified in trying it in dispensary practice. His attention had been first directed to it by Dr. White's article in the *Lancet* in March, 1888, referred to in the paper. It would certainly be a great advantage, he thought, if we could get any agent which would at all take the place of the bromides in those cases of epilepsy where the use of the latter was attended with bad effects. The tincture of simulo, so far as employed, would seem at least to have no bad effects. Dr. Starr had expressed no opinion as to the mode of action of this drug, and he thought some information on this point was desirable, as nothing had as yet, so far as he knew, been published regarding it. On the whole, simulo seemed worthy of a further trial. In some of the cases reported it appeared to do well when given in connection with the bromides, and he would like to inquire if Dr. Starr had ever used it in this way.

DR. LANDON CARTER GRAY said that he could only agree with Dr. Starr as to the uselessness of simulo in epilepsy. He had tried it in several cases, (at least four or five), both alone and in combination, and had obtained from it no results except such as one could get in almost any case of epilepsy by changing the drugs employed. This was merely a temporary effect, and the same could be obtained by a hundred other agents. He had, therefore, discontinued the employment of simulo, as it had in his hands proved so nearly useless as not to afford sufficient encouragement to give it a more extended trial.

DR. STARR said, in answer to Dr. Fisher's question, that he had not tried simulo in combination with the bromides.

CORRESPONDENCE.

ACUTE MELANCHOLIA AS A SEQUEL OF GYNECOLOGICAL OPERATIONS.

To the Editor of THE MEDICAL NEWS,

SIR: Dr. T. Gaillard Thomas, in a paper read before the New York Academy of Medicine, April 4, 1889, entitled "Acute Mania and Melancholia as Sequelæ of Gynecological Operations," said: "There is very little literature extant upon this subject, which, until recently, has appeared to attract no attention. For obtaining what little there is I am indebted to two of my friends, Dr. Paul F. Mundé and Dr. Andrew J. McCosh, who have kindly looked it up for me. *Prior to the year 1887 there is nothing.*"

Mr. Lawson Tait, in a lecture delivered at the Jefferson Medical College Hospital, September 13, 1884, called "Abdominal Section in Disease of the Uterus or of the Uterine Appendages," and published in THE MEDICAL NEWS of September 27, 1884, spoke thus:

"Removal of the uterine appendages. . . . . After the operation. . . . . So far we have not had any trouble, except *from one thing, and this a distressing one.* It occurs after all sorts of abdominal operations, after exploratory incisions, after the removal of one ovary for cystoma, after the removal of both ovaries for cystoma, and after hysterectomy. I refer *to the occurrence of acute melancholia.* All the cases of mental alienation that I have seen following these operations are seven in number, and all have taken the direction of this most unfavorable form of insanity—acute melancholia. I cannot say that any one of them is likely to recover. I do not know that this is a necessary result in a certain number of cases. I have performed abdominal section some 960 times, and in this number I have met with 7 cases of acute melancholia. Of course, a good many of these cases died, especially in the earlier years of my practice. We may state that acute melancholia occurs in about one per cent. of those submitted to abdominal section. I do not know that anything like this follows other surgical operations. This is the only after-result of an objectionable character with which I am acquainted."

During the meeting of the New York Academy of Medicine, April 4, 1889, at which Dr. Thomas read the above-mentioned paper, Dr. Landon Carter Gray thought "that Dr. Thomas deserved the credit of having described *a new genus of insanity*, having related six cases and referred to twenty others."

Finally, Dr. Thomas expressed "the hope that other cases would be reported as they occurred, and that the subject would be investigated more thoroughly."

HENRY A. SHELLEY, M.D.

319 EAST ONE HUNDRED AND TWENTIETH STREET,
NEW YORK CITY.

AUTOMATIC AMBULATION.

To the Editor of THE MEDICAL NEWS,

SIR: Under the above title two cases of a rare form of epilepsy have been described. As Dr. Starr truly said, it was known before the case reported by Dr. Donaldson.

In Strümpell's second volume, page 429, in his article on epilepsy, he describes a form of psychical attack. This is given the name of "*Psychisch-epileptischen Aequivalente.*" This is identical in character with the cases described by Dr. Starr and Dr. Donaldson. In Prof. Westphal's clinic, in January, 1888, the writer saw a patient suffering from this form of epilepsy. The attacks were, however, of short duration, rarely exceeding five minutes. But during that time the patient's acts were clearly those of a person with changed consciousness, for they had no relation to what she was doing immediately before the attack or to what she did immediately after the attack was over. She remembered nothing of what she did at these times of changed consciousness.

Very respectfully,

JAMES W. PUTNAM, M.D.

388 FRANKLIN ST., BUFFALO, April 19, 1889.

OBITUARY.

SAMUEL W. GROSS, M.D.

SAMUEL W. GROSS, M.D., LL.D., Professor of the Principles of Surgery and Clinical Surgery in the Jefferson Medical College, died on Tuesday, April 16th, at his home in Philadelphia, in the fifty-third year of his age. He was taken sick about the 25th of March, and typhoid pneumonia developed, marked by high temperatures and an almost constant delirium, from the effects of which he sank. He was attended in his last illness by Drs. Da Costa, Osler, Horwitz, and Wirgman, and was unremittingly watched and nursed.

Dr. Gross was the eldest son of the late Prof. Samuel D. Gross, and was born in Cincinnati, February 4, 1837. He was educated at Shelby College, Kentucky, began the study of medicine at the Medical Department of the University of Louisville, and continued it at the Jefferson Medical College of Philadelphia, in the session of 1856–57, and from which he was graduated in March, 1857. After a visit to Europe, he settled in Philadelphia and commenced the active practice of his profession, acting for a time as co-editor of the *North American Medico-Chirurgical Review.* When the war broke out in 1861, he at once entered the service of the United States. He was appointed Brigade Surgeon (U. S. Vols.) August 3, 1861, and was on duty with General Thomas's command, Army of the Ohio, and as Medical Director, Fifth Division Army of the Ohio, until July, 1862, and subsequently at De Camp General Hospital, David's Island, New York Harbor, until July 28, 1863; and at Draft Rendezvous, Riker's Island, New York, to August 26, 1863. He was then ordered to Hilton Head, South Carolina, and from September to November, 1863, was in charge of Field Hospital, and Surgeon-in-Chief at Morris Island, South Carolina. In January and February, 1864, he was Chief Medical Officer Northern District, Department of the South, and from March to May, 1864, was on duty as Medical Director District of Florida, at Jacksonville, Florida. In June, 1864, he was assigned to the Department of the Susquehanna, and was on duty at Haddington General Hospital, Philadelphia, Pa., until May, 1865. He was mustered out of service June 24, 1865. He was brevetted Lieutenant-Colonel, June 1, 1866, and his commission sent him June 15, 1866. In the discharge of his military duties Dr. Gross evinced remarkable efficiency and ability, and was greatly beloved by the officers with whom he was associated.

At the conclusion of the war he returned to Philadelphia, and again entering into practice, became surgeon to the Howard Hospital, the Philadelphia Hospital, and the Hospital of the Jefferson Medical College. He was also appointed Lecturer on Genito-Urinary Diseases in the summer course of the Jefferson Medical College, and in the spring of 1882, on the retirement of his father from the chair of surgery, the chair was divided, and Dr. Samuel W. Gross was appointed Professor of the Principles of Surgery and Clinical Surgery, and Dr. John H. Brinton, Professor of the Practice of Surgery, and Clinical Surgery. His chair of Principles Dr. Gross held until his death, his last clinical lecture being delivered only a few days before he was taken fatally ill. Several years before his death he received the degree of LL.D.

In 1876 Dr. Gross was married, and his wife survives him.

He was an active Fellow of the College of Physicians of Philadelphia, and served for years as a member of the Library Committee. At the death of his father, in 1884, he was elected President of the Board of Trustees of the Pennsylvania College of Dental Surgery. He also served as President of the Pathological Society of Philadelphia.

Dr. Gross's contributions to journalistic literature and to the proceedings of societies were many and various. In the *North American Medico-Chirurgical Review* for January, 1859, he published "A Case of Aneurism of the Right Femoral Artery cured by Digital Compression, with remarks, and a statistical report of twenty-two other cases treated by this method." In the *American Journal of the Medical Sciences* for 1869, he reported "A Case of Poisoning from Atropia;" in the same journal for January and April, 1867, he published an elaborate article on "Wounds of the Internal Jugular Vein, and their Treatment," strongly advocating the ligation of the vein. In the October number of the *Journal* for the same year, he wrote a most able review of sixty pages on eleven works on military surgery in English, French, and German. In this he entered extensively into gunshot injuries of the head and of the joints, and presented the statistics of 13,514 amputations for gunshot injuries, a number which he subsequently increased to 20,933 in the sixth edition of Gross's *Surgery*. For the April, 1871, number of the same journal, he wrote a valuable paper on "Ulceration of the Jugular Veins, communicating with an Abscess or Open Sore."

The study of tumors and of malignant disease was one which possessed peculiar fascination for him. In July and October, 1879, he published in the *American Journal of the Medical Sciences* a valuable paper based upon much original investigation on sarcoma of the long bones. This paper, as also his treatises on mammary tumors, in 1880, was in part the outcome of his Mütter lectures on Surgical Pathology, delivered before the College of Physicians of Philadelphia. In the *Transactions of the American Surgical Association* for 1881 and 1882, he published articles on carcinoma of the breast and on the resulting cicatrices after operation, and in the *Transactions* for 1883 he reported a case of nephrectomy for medullary sarcoma and partial cholecystectomy for calculus upon the same subject. In 1884, he read a paper before the Association on "Stricture of the Œsophagus, and the Operations for its Relief," and in 1887, one on the "Prognosis of Sarcomata of the Breast," in which his own results were largely embodied. In the March and April numbers of the *American Journal of the Medical Sciences* for 1888, he published a "Clinical Study of Carcinoma of the Breast and its Treatment." In this paper particular attention was given to metastatic deposits, and Dr. Gross described and pictured his own method of operating, and insisted upon the necessity of opening the axilla, and on the complete removal of all involved or suspected glands.

He also prepared for the second volume of the *American System of Gynecology*, edited by Dr. Mann, a voluminous article on "Tumors of the Breast," in which the doctrines he held and taught on the pathology, clinical characters, and treatment of these affections are vividly set forth.

In 1880, Dr. Gross published his *Treatise on Tumors of the Mammary Gland*, embracing their histology, pathology, diagnosis, and treatment. On tumors of the female breast, Dr. Gross has been recognized as an authority both at home and abroad. His accurate knowledge of the pathological anatomy of these affections guided him in his clinical treatment which undoubtedly was preeminently successful. In 1881, his *Practical Treatise on Impotence, Sterility, and Disorders of the Male Sexual Organs* appeared. Both of these works passed to second editions. He also at various times did much to assist his father in the preparation of the successive editions of Gross's *Surgery*. In 1876 he edited his father's treatise on *Diseases, Injuries, etc., of the Urinary Bladder*, and in 1887, in conjunction with his brother, A. Haller Gross, Esq., he edited the autobiography of his father.

As one of the staff of THE MEDICAL NEWS he was a frequent and valued contributor to our pages, and his articles were always characterized by surgical acumen, breadth of view, fidelity to detail, learned research, clearness of expression and practical application.

From this summary of his lifework, it will be seen that his pen was never idle. He was always writing something, and as soon as one paper appeared, he busied himself in the preparation of another. He endeavored to have a contribution for each annual meeting of the American Surgical Association. He was not merely a reporter of cases; his aim was far higher; he sought in a true philosophical spirit, by the study of groups of cases and pathological conditions to arrive at the cause of disease, and to grasp the great principles of clinical treatment. His ultimate object was the cure of disease and the alleviation of human suffering. All studies were with him secondary to these ends, and to attain them, he labored continuously, wisely, and, we may say, successfully to a marked degree.

But the last labor of his life, and one of which he often spoke to the writer of this notice, with an energy and enthusiasm all his own, was a paper on "Stone in Children, and the Operations for its Relief," to appear in the forthcoming *Cyclopædia of the Diseases of Children*. To solve the question of the proper operation he had undertaken a thorough search through periodical literature for extensive data from which to deduce his conclusions, and to the same end he had written many letters, seeking the experiences of surgeons and hospitals at home and abroad. The arrival of each answer was warmly welcomed, and the information it gave recorded with delight. His unfinished notes and criticisms, his unused data, now rest on his office table, and it is a sad reflection that in the delirium of his fatal illness his mind constantly reverted to the cherished thoughts of his last working hours.

Dr. Gross took a deep and active interest in the medical societies with which he was connected, and especially in the American Surgical Association, which was founded by his father, whose profile is borne upon its seal. In his attendance at medical gatherings he was by no means a passive or silent member. He was a progressive man and, having greatly at heart the welfare of the profession and the advancement of medicine, his voice was often heard, and with no feeble or uncertain meaning. His utterances carried weight, not only because of the soundness of his views, but also from the

bold, honest, and straightforward manner in which he advocated them.

He was a learned surgeon, deeply versed not only in the medical literature of his own language, but also in that of Germany and France. He was a constant reader of periodicals, reports, and transactions of societies. His memory was retentive, and the precise information thus stored up, was always at his instant command. His professional judgment was unusually correct, and his surgical treatment was based on an accurate knowledge of the pathological anatomy of diseased or injured parts.

As an operator he was bold and self-reliant. He was systematic in the highest degree. Every step in the operation was thoughtfully planned, and boldly, judiciously, and promptly carried out. He was fertile of resource, undaunted, and well able to meet and deal with the contingencies of operative surgery. He was a thorough and careful operator, seeing to the final steps and dressing of an operation with an unremitting attention. His operations were well done to the end.

As a lecturer Dr. Gross was eloquent, earnest, and enthusiastic. He was loved and respected by his class, who fully appreciated his rare power of imparting knowledge and his unflagging efforts for their instruction. He was indeed a model teacher. His style was clear, logical, and terse. He taught in an eminent degree principles; and seeing clearly, he sought to make others see. He succeeded, and his lectures, didactic and clinical, were thronged with listeners of maturer years, who came to profit by his lessons.

In manner he was energetic and quick. In thought and discussion he at once went to the gist of a matter, and impressed all as a man of force and decided character. He was warm-hearted and hospitable, and to the young and struggling physician he was more than a friend, ever ready to lend a helping hand, and often rendering benefactions in secrecy and silence. To those who stood near to him and knew him best, he was most kind and gentle, a faithful friend, loyal in times of trouble, tender, and true. In life he was loved and honored; the void he leaves will be not easily filled, and his memory, entwined with that of his father and predecessor, will long endure.

NEWS ITEMS.

In Memoriam.—At a meeting of the Philadelphia County Medical Society, held April 17th, a minute was adopted expressive of regret for the death of Dr. Bruen and esteem for his services. We make the following extracts:

"Dr. Edward Tunis Bruen, late Vice-President of this Society, has been removed from our midst by the relentless hand of death. Never physically strong, especially since receiving his degree in medicine in 1873, he rapidly succumbed to an attack of double croupous pneumonia, which proved fatal Sunday, March 31st, less than a week from its incipiency. Despite his apparent lack of strength he exhibited a remarkable endurance, and accomplished a vast amount of work in varied lines, as teacher, writer, and practitioner. As a student he seemed indefatigable, as evidenced by his familiarity with medical literature, as well as by his services on the staffs of so many hospitals.

"His writings were extensive, not only for the many societies of which he was a member, but also of original articles for the medical journals, and for comprehensive systems of medicine. He was also a popular private preceptor, and had numbers of students constantly under his direction.

"Personally Dr. Bruen was a delightful companion, whose native refinement and rare geniality made him prominent in every gathering which he graced, and made him always welcome to a very large circle of professional friends.

"This Society has lost through his death an active, interested, and highly valued member, in the prime of his usefulness; and many of us feel the loss of a loved and never-to-be-forgotten friend."

AT a meeting of the German Medical Society of Philadelphia, held April 8, 1889, the following minute was adopted:

"The German Medical Society of Philadelphia records with profound sorrow the loss of its honored member, Dr. Edward T. Bruen, whose wide and growing fame as a scientist, as well as whose rare personal qualities, have won for him high honors and the affectionate regard of all who knew him."

OFFICIAL LIST OF CHANGES IN THE STATIONS AND DUTIES OF OFFICERS SERVING IN THE MEDICAL DEPARTMENT, U. S. ARMY, FROM APRIL 16 TO APRIL 22, 1889.

SMITH, A. K., *Lieutenant Colonel and Surgeon.*—Reports the address of the New Army Building as at No. 39 Whitehall Street, New York City, April 18, 1889.

WILLIAMS, JOHN W., *Major and Surgeon.*—Died at Jackson Barracks, Louisiana, April 15, at 5.06 P.M.

HAPPENSETT, JOHN C. G., *Major and Surgeon.*—Is relieved from duty at Willett's Point, New York, and ordered to report to the commanding officer Atlanta Barracks, Georgia, for duty as Post Surgeon at that post.—Par. 12, *S. O. 88, A. G. O.*, April 16, 1889.

EWEN, CLARENCE, *Major and Surgeon.*—Promoted Surgeon U. S. Army, with the rank of Major, to take effect April 15, 1889.

Pursuant to instructions received from the Adjutant-General's Office, Washington, April 13th, the following-named medical officers will assemble with troops in New York Harbor, on the 27th instant, prepared for field service in connection with the New York Centennial parade: ROBERT H. WHITE, *Major and Surgeon;* CLARENCE EWEN, *Major and Surgeon;* JOHN J. COCHRAN, *Captain and Assistant Surgeon;* and CHARLES B. EWING, *First Lieutenant and Assistant Surgeon*—*S. O. 90, Headquarters Division of the Atlantic, Governor's Island, New York City*, April 19, 1889.

WOODRUFF, CHARLES E., *First Lieutenant and Assistant Surgeon.*—Is relieved from duty at Fort Mackinac, Michigan, and ordered to Fort Gaston, California, for duty.—Par. 14, *S. O. 86, A. G. O.*, April 13, 1889.

MCKEE, JAMES C., *Lieutenant-Colonel.*—Leave of absence granted in S. O. 44, A. G. O., February 21, 1889, is extended seven days.—Par. 11, *S. O. 86, A. G. O.*, April 13, 1889.

POLHEMUS, ADRIAN S., *Captain and Assistant Surgeon.*—Is relieved from duty at Fort Gaston, California, and ordered to Fort Monroe, Virginia, for duty.—Par. 14, *S. O. 86, A. G. O.*, April 13, 1889.

APPEL, AARON H., *Captain and Assistant Surgeon.*—Is granted leave of absence for twenty-one days.—Par. 1, *S. O. 38, Headquarters Division of the Missouri*, April 16, 1889.

Under authority from the Secretary of War, conveyed by letter of the 16th ultimo, from Division Headquarters, the post of Fort Sisseton, Dakota, will be discontinued from June 1, 1889.—*S. O. 35, Headquarters Department of Dakota, St. Paul, Minnesota*, April 8, 1889.